

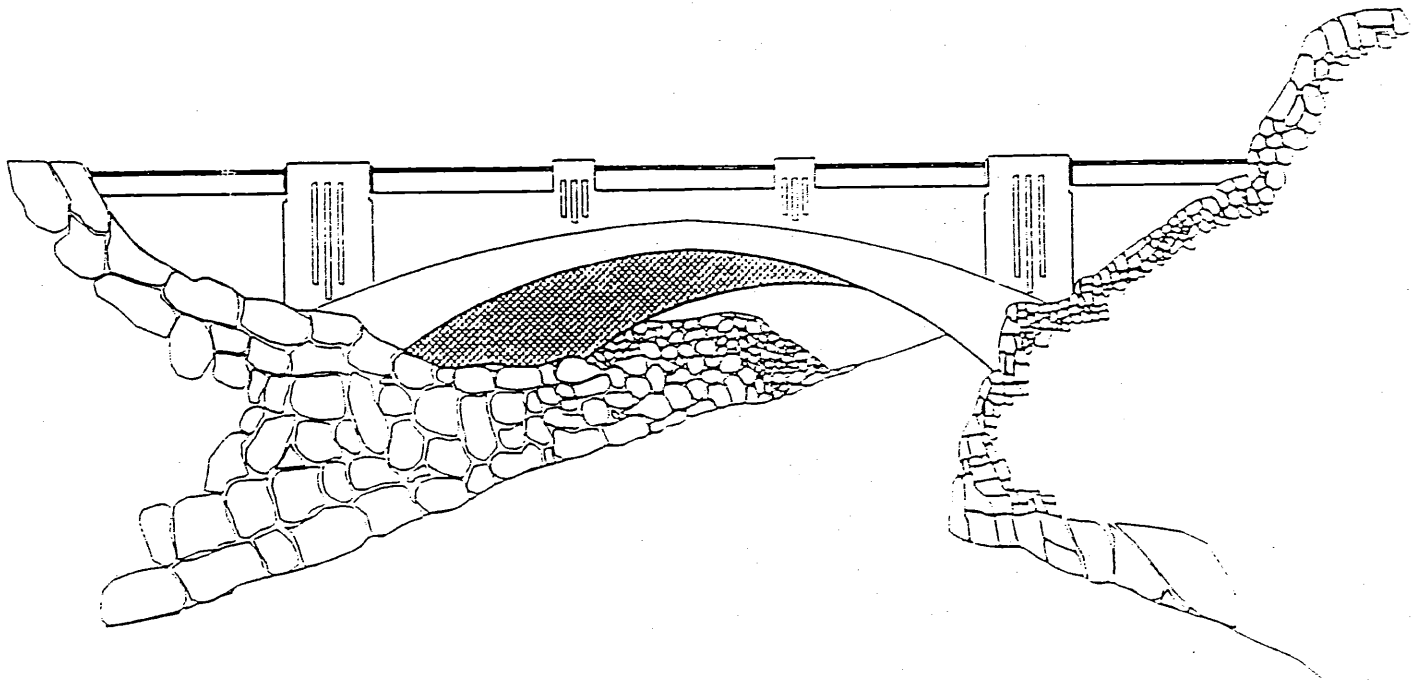


US Army Corps  
of Engineers

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# Bridge Inspection Program

## FY 98 Routine Inspections



September 1998

New England District

**BRIDGE INSPECTION PROGRAM  
FY 98 ROUTINE INSPECTIONS  
NEW ENGLAND DISTRICT**

**SEPTEMBER 1998**

**DEPARTMENT OF THE ARMY  
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS  
CONCORD, MASSACHUSETTS**

FY 98 Routine Inspection Reports  
Various Reservoir Area  
and Spillway Bridges

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DEPARTMENT OF THE ARMY  
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS  
CONCORD, MASSACHUSETTS

## **I. EXECUTIVE SUMMARY**

The inspection findings and recommendations presented herein are based on inspections of the 17 referenced bridges conducted during the period between April 30, 1998 and August 25, 1998. Inspections were performed by personnel from the Structural Unit, New England District, Corps of Engineers, under the supervision of the team leader in charge of Bridge Inspections.

The purpose of the inspections was to detect any conditions of structural distress or operational inadequacy, with the ultimate goal being to increase the useful life and assure the continued safety of the structures. Previous Routine Inspections performed in FY 96 by similiar Corps of Engineer personnel served as a baseline for comparison.

The overall condition of the bridges inspected varied from fair to good. Although no significant structural deficiencies were noted, several bridges exhibited conditions which warrant rehabilitation (See Summary of Bridges Inspected and Overall Assessment).

Five bridges were considered Fracture Critical, and as such were inspected according to a Fracture Critical Inspection Plan (See Fracture Critical Inspection Plan and Evaluation). No cracks or flaws were observed in any of the Fracture Critical Members (FCM's) of these structures. Therefore, no further non-destructive testing is recommended.

Based on the overall adequate condition of all bridges inspected, it is recommended to continue to inspect these structures at the current 2-year (24 month) frequency.



NEW ENGLAND DISTRICT  
FY 98 ROUTINE BRIDGE INSPECTION PROGRAM

**II. PURPOSE AND SCOPE**

The purpose of the routine bridge inspections is to inspect the physical condition of the structures and to verify and update the findings and evaluations reported in the previous inventory and routine inspections. All previously detected areas of structural distress or operational inadequacies were reevaluated and any new deficiencies documented with the overall goal being to increase the useful life of the structures and to ensure the continued safety of the bridge users.

**III. AUTHORITY**

The basis for the inspections and reports is contained in ER 1110-2-111, "Periodic Safety Inspection and Continuing Evaluation of United States Corps of Engineers Bridges."

**IV. INSPECTION PROCEDURE**

The overall inspections were performed in accordance with AASHTO's 1994 "Manual for Condition Evaluation of Bridges", Department of Transportation's "Bridge Inspector's Training Manual 90" and all applicable provisions of ER 1110-2-111. The inspection program was implemented under the direct supervision of a registered Professional Engineer. The most recent inventory and routine inspection reports were thoroughly reviewed by inspection personnel prior to and during the field inspections.

Except as noted, the under bridge inspections of all spillway bridges was accomplished with a "Snooper", which is a truck-mounted scaffolding device. All under bridge elements were inspected from the "Snooper" bucket with the truck travelling along the deck above, stopping to access all critical areas requiring a more detailed, or close-up, inspection.

The underside of all smaller Reservoir Area bridges were accessed using a ladder, waders, and a small boat, or some combination thereof, as required. During all inspections, all pertinent safety equipment was utilized and all relevant safety procedures were followed.

### III. REPORTING PROCEDURE

For each bridge an overall report has been prepared. Included are the inspection date, dates of all previous inspections, bridge description and history, vehicle ratings, evaluation of each structural component and an overall bridge rating which is compared with that of the previous inspection. Also included are the previously recommended remedial repairs, the status of these recommendations and any new recommendations and/or comments based on the current inspection. The Standard Structures Inspection Field Report and Scour Checklist (an NAE devised form based on Federal Highway Administration guidelines) are checklists that are completed in the field. The Scour Checklist is only completed for structures that span an active waterway and therefore is not applicable to any spillway bridges.

Note: The spillway bridge at Tully Lake, MA, was not inspected with a "Snooper". This structure is a concrete arch and can be accessed fairly easily from the ground level.

### IV. SUMMARY OF BRIDGES INSPECTED

The NAE 1998 Routine Bridge Inspection program included the inspection of 17 bridges. A summary for each bridge is listed herein. Bridges inspected, projects, 1998 and 1996 condition ratings, inspection dates, estimated rehabilitation costs, rehabilitation priorities with temporary posting required (if necessary), and degree of existing scour are summarized below:

#### Rehab Priority (Required posting, if necessary, in tons)

1 Bridge currently unable to tolerate present traffic/loads. Prompt remedial measures are required. Bridge should be posted and/or restricted as indicated until all corrective measures can be accomplished.

2 Major items require rehabilitation. Minimum adequacy to tolerate current traffic/loads. Further deterioration may cause Priority 1.

2a Rehab work where structural capacity has not been affected, but where aesthetics or safety is an important consideration.

3 Minor items require rehabilitation to maintain condition.

#### Scour

- 1 Major Scour Activity
- 2 Moderate Scour Activity
- 3 Minimal or No Scour Activity

## SUMMARY OF BRIDGES INSPECTED

<u>Project/BRIDGE</u>	<u>Date Inspected</u>	<u>Condition</u> <u>1998</u>	<u>Rating</u> <u>1996</u>	<u>Est. Rehab</u> <u>Cost (\$ K)</u>	<u>Rehab</u> <u>Priority</u>	<u>Scour</u>
Tully Lake						
1. SPILLWAY	4/30/98	8	8	0	-	NA
Barre Falls Dam						
2. PINE PLAINS	4/30/98	5	6	42	2	2
Westville Lake						
3. OLD MASHPAUG ROAD	5/29/98	8	8	0	-	3
4. OLD SOUTH STREET	5/29/98	7	8	3	3	3
East Brimfield Lake						
5. FIVE BRIDGES ROAD	6/17/98	8	8	0.5	3	3
6. POND	6/17/98	6	7	20	2	3
7. OLD MORSE ROAD	6/17/98	5	6	75	3*	3
Thomaston Dam						
8. SPILLWAY	6/22/98	6	7	223	2	NA
Littleville Lake						
9. SPILLWAY	6/23/98	7	7	50	2	NA
West Thompson Lake						
10. SPILLWAY	6/24/98	6	6	285	2	NA
Barre Falls Dam						
11. SPILLWAY **	6/24/98	7	7	30	2	NA
Everett Lake						
12. SPILLWAY	6/25/98	7	7	1	3	NA
Surry Mountain Lake						
13. SPILLWAY **	6/26/98	7	8	152	2	NA
Townshend Lake						
14. SPILLWAY **	6/27/98	6	7	145	2	NA
North Springfield Lake						
15. SPILLWAY **	6/27/98	7	7	0	-	NA
Union Village Dam						
16. OLD ROUTE 132	8/25/98	8	8	0	-	3
Ball Mountain Lake						
17. SLASON **	8/26/98	8	8	15	2a	3

\* Note: Old Morse Road Bridge will require rehabilitation only if reopening to traffic is intended.

\*\* Fracture Critical Bridges (See Fracture Critical Inspection Plan and Evaluation)

## VII. FRACTURE CRITICAL INSPECTION PLAN AND EVALUATION

A Fracture Critical Member (FCM) is a member in tension or with a tension element, whose failure would cause either a portion of, or the entire bridge to collapse. FCM's are subject to fracture due to either brittle or fatigue failure. The following bridges are considered fracture critical, and were inspected as such:

Barre Falls Dam	Spillway Bridge
Surry Mountain Lake	Spillway Bridge
North Springfield Lake	Spillway Bridge
Townshend Lake	Spillway Bridge
Ball Mountain Lake	Slason Bridge

The spillway bridges at Barre Falls, Surry Mountain and North Springfield are considered structurally non-redundant because each span is supported by only two girders. Failure of either girder would result in collapse of the bridge. Therefore, the two main girders at each bridge are considered the FCM's.

The trusses at Townshend Lake Spillway Bridge (Deck Truss) and Ball Mountain/Slason Bridge (Through Truss) are simple spans with built-up bolted and riveted members, respectively. The bottom chords are all tension members, the failure of which could result in collapse of the bridge, and therefore, are considered FCM's. Several of the diagonals are in tension and, conservatively, these are also considered to be FCM's. The floorbeams have tension bending stresses in the web and bottom flange and are load path nonredundant since failure of a floorbeam could result in a complete loss of a portion of the deck between adjacent floorbeams. Therefore, the floorbeams are also considered to be FCM's.

The FCM inspection plan for these bridges was performed in accordance with ER 1110-2-111 (Appendix B), the "Bridge Inspector's Training Manual/90", and the Federal Highway Administrations "Inspection of Fracture Critical Bridge Members".

For the three two-girder bridges the inspection plan consisted of a very detailed "hands-on" inspection of the bottom (tension) flanges, webs, flange-web interface, stiffener welds and rivets (where appropriate). For the truss tension members and floorbeams, each member was closely inspected for tightness, flaws in bolts or rivets, and nicks, gouge or tears from impact. Any cracks or flaws identified during the visual inspection would be further investigated using appropriate non-destructive testing methods.

A thorough inspection of the FCM's of the five bridges included in the Fracture Critical Inspection Plan was performed as part of the Routine Inspection for each bridge. The FCM's are all in good condition with no signs of cracks or flaws. Because of the overall good condition of the FCM's, no further investigation using non-destructive testing is recommended at this time; it is also recommended that future Fracture Critical Inspections continue to be performed concurrently with the Routine Inspections at the scheduled 2-year (24 month) interval.

## VIII. OVERALL ASSESSMENT

The overall condition of the bridges inspected in FY 98 ranges from fair to good. Although no deficiencies which would affect the structural integrity of the bridges or the overall safety of the public, the following bridges exhibited conditions which warrant rehabilitation within a reasonable time frame (Rehab Priority 2); the bridges are listed in order of priority:

<u>Bridge</u>	<u>Status of Rehab Work</u>
1. West Thompson Lake Spillway Bridge	Budgeted for FY 99 Design.
2. Thomaston Dam Spillway Bridge	Budgeted for FY 99 Design.
3. Townshend Lake Spillway Bridge	Project Issued for Bid during FY 98; Contract not yet awarded.
4. Littleville Lake Spillway Bridge.	Funds not yet Budgeted.
5. East Brimfield Lake Pond Bridge	Funds not yet Budgeted.
6. Barre Falls Dam Spillway Bridge	Funds not yet Budgeted.
7. Surry Mountain Spillway Bridge.	Funds not yet Budgeted.
8. Barre Falls Pine Plains	Funds not yet Budgeted.
9. Ball Mountain Lake Slason Bridge	Funds not yet Budgeted.

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<u>PROJECT</u>	<u>BRIDGE</u>	<u>PAGE</u>
(1) Tully Lake, MA	Spillway	1
(2) Barre Falls Dam	Pine Plains	8
(3) Westville Lake, MA	Old Mashpaug Road	17
(4) Westville Lake, MA	Old South Street	25
(5) East Brimfield Lake	Five Bridges Road	34
(6) East Brimfield Lake, MA	Pond	47
(7) East Brimfield Lake, MA	Old Morse Road	56
(8) Thomaston Dam, CT	Spillway	64
(9) Littleville, MA	Spillway	73
(10) West Thompson Lake, CT	Spillway	81
(11) Barre Falls Dam	Spillway	88
(12) Everett Lake, NH	Spillway	96
(13) Surry Mountain Lake, NH	Spillway	102
(14) Townshend Lake, VT	Spillway	109
(15) North Springfield Lake, VT	Spillway	116
(16) Union Village Dam, VT	Old Route 132	123
(17) Ball Mountain Lake, VT	Slason	131

**INDIVIDUAL  
REPORTS**

TULLY LAKE  
SPILLWAY BRIDGE  
ATHOL, MASSACHUSETTS  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

30 April 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection,	22	Aug	96
Routine Inspection,	06	July	94
Routine Inspection,	16	June	92
Routine Inspection,	02	Aug	90
Routine Inspection,	06	June	88
Inventory Inspection,	14	May	84

BRIDGE DESCRIPTION AND HISTORY

The spillway bridge at Athol, Massachusetts is a 68'-0" long filled spandrel fixed arch concrete structure constructed in 1948. The roadway width across the bridge is 22'-0" between 3'-0" sidewalks. On each side of the deck, there are 1'-2" wide by 3'-5" high parapets.

The concrete arch thickness varies from 2'-0" at the centerline to 11'-0" at the spring line. A typical roadway section consists of 9" thick concrete deck and concrete approach slabs. The abutments are of cellular construction, and the cells are filled with pervious backfill. The bridge is on a flat grade.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	29T	49T	No change in rating.
3	40T	69T	
3S2	48T	82T	
3-3	53T	91T	

EVALUATION (See attached "Structures Inspection Field Report")

A. Approach Roadway

Approach alignment of the roadway is good in both directions. Both the north and south bituminous approach roadways transition into 5'-0" wide sections of concrete approach pavement, which are



in very good condition. The steel beam guardrails at both approaches are tied into bridge parapets and are still in excellent condition. The granite curbs at the southeast and northwest approaches are in good condition. The corner of the southeast curb is cracked. The cracking and spalling at the sidewalks, mentioned at the previous routine inspection, have not changed significantly.

#### B. Deck

The overall condition of the concrete deck is good. The parapets at each side of the deck is in good condition structurally. The reapplied cementitious sealer looks great and shows no discoloration or staining. The hairline cracks at the sidewalks caused by the not fully cut chamfer joints have not changed significantly. The interior edge of the west sidewalk has numerous minor spalls caused by vehicle or equipment collisions. The largest of the spalls measures 12" x 3" x 1" deep. The concrete deck surface was installed and sealed with a penetrating sealer in FY 96 and is in very good condition. Minor hairline cracks are found on the deck surface. Scaling was noted for the full length of the deck along the west curb edge for a width of up to 26" from the curb. This condition was documented in the previous inspection report and has not changed.

#### C. Superstructure

The east and west fascias of the concrete arch are in overall good condition. Spall repairs and elastomeric joint sealants are in good condition. Areas of map cracking with efflorescence were noted at the west fascia. Hairline cracks with efflorescence were also noted at the east fascia. The underside of the arch is in good condition with some graffiti at the northeast edge. Drains at both the north and south ends of the arch are significantly corroded and falling apart with a touch. The concrete below the drains are stained.

#### D. Substructure

Minor abrasion and spalling were noted on the west and east fascias at the joint between the arch and the north abutment base. There is also moderate efflorescence leaching between the arch and the base joint at the north abutment face. Water draining off the road and down the northeast slope has caused undercutting of the arch base measuring 2'-0" long x 1'-4" deep x 7" high. Map cracking was noted at the west face of the south abutment base. There is also a 1/2" wide x 18" long x 1" deep crack present at the southwest base.

#### E. Channel

This spillway channel is generally dry. The channel orientation is very good. Several rock falls from the spillway channel walls were noted in the upstream channel.

#### CONDITION RATING

Routine, 1998	8
Routine, 1996	8
Routine, 1994	6
Routine, 1992	7
Routine, 1990	7
Routine, 1988	7
Inventory, 1984	7

#### RECOMMENDATIONS

##### A. Status of Previous Recommendations

Monitor scale at the south bridge deck to determine whether the deck continues to deteriorate.

No Change Since 1996.

##### B. Revised Recommendations

Continue to monitor scaling as part of normal routine inspection.

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>ATHOL, MA</b>		bridge dept. no.		8-structure no. <b>CEPNE MA 2510009</b>		90-date inspected <b>30 APRIL 98</b>	
list.	104-highway system <b>7 - NOT ON NAS</b>	22-owner <b>ARMY CORPS OF ENGINEERS</b>	27-year built <b>1948</b>	106-year rebuilt	11-milepoint		
43-structure type <b>III - CONCRETE ARCH - DECK</b>				quality control engineer <b>NICK FORBES</b>			
07-facility carried <b>ROUTE 32</b>				team leader <b>JOE COLUCCI</b>			
06-features intersected <b>TULLY LAKE SPILLWAY CHANNEL</b>				team members <b>JENNIFER LEE; ED HILLS</b>			

<b>item 58</b> <span style="float: right;"><b>7</b></span> <b>DECK</b> 1. Wearing Surface <span style="float: right;"><b>7</b></span> 2. Deck-Condition <span style="float: right;"><b>8</b></span> 3. Stay in Place Forms <span style="float: right;"><b>NA</b></span> 4. Curbs <span style="float: right;"><b>NA</b></span> 5. Median <span style="float: right;"><b>NA</b></span> 6. Sidewalks <span style="float: right;"><b>7</b></span> 7. Parapet <span style="float: right;"><b>8</b></span> 8. Railing <span style="float: right;"><b>NA</b></span> 9. Anti Missile Fence <span style="float: right;"><b>NA</b></span> 10. Drains <span style="float: right;"><b>NA</b></span> 11. Lighting Standards <span style="float: right;"><b>NA</b></span> 12. Utilities <span style="float: right;"><b>NA</b></span> 13. Deck Joints <span style="float: right;"><b>8</b></span> 14. Approach Settlement <span style="float: right;"><b>8</b></span>	<b>item 59</b> <span style="float: right;"><b>8</b></span> <b>SUPERSTRUCTURE</b> 1. Bearing Devices <span style="float: right;"><b>NA</b></span> 2. <del>Stringers</del> ARCH <span style="float: right;"><b>8</b></span> 3. Diaphragms <span style="float: right;"><b>NA</b></span> 4. Girders or Beams <span style="float: right;"><b>NA</b></span> 5. Floor Beams <span style="float: right;"><b>NA</b></span> 6. Trusses <span style="float: right;"><b>NA</b></span> 7. Rivets or Bolts <span style="float: right;"><b>NA</b></span> 8. Welds <span style="float: right;"><b>NA</b></span> 9. Collision Damage <span style="float: right;"><b>8</b></span> 10. Load Deflection <span style="float: right;"><b>8</b></span> 11. Member Alignment <span style="float: right;"><b>8</b></span> 12. Load Vibration <span style="float: right;"><b>8</b></span> 13. Paint-Epoxy <span style="float: right;"><b>NA</b></span> 14. Year Painted <span style="float: right;"><b>NA</b></span> 15. Under Clearance _____ ft _____ in Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<b>item 60</b> <span style="float: right;"><b>7</b></span> <b>SUBSTRUCTURE</b> 1. Abutments a-Wings <span style="float: right;"><b>NA</b></span> b-Backwall <span style="float: right;"><b>NA</b></span> c-Bridge Seats <span style="float: right;"><b>NA</b></span> d-Breastwall <span style="float: right;"><b>NA</b></span> ARCH BASE <del>a-Footings</del> <span style="float: right;"><b>7</b></span> f-Files <span style="float: right;"><b>NA</b></span> g-Erosion <span style="float: right;"><b>7</b></span> h-Settlement <span style="float: right;"><b>8</b></span> 2. Piers or Bents a-Caps <span style="float: right;"><b>NA</b></span> b-Column <span style="float: right;"><b>NA</b></span> c-Web <span style="float: right;"><b>NA</b></span> d-Footing <span style="float: right;"><b>NA</b></span> e-Files <span style="float: right;"><b>NA</b></span> f-Scour <span style="float: right;"><b>NA</b></span> g-Settlement <span style="float: right;"><b>NA</b></span> 3. Collision Damage <span style="float: right;"><b>8</b></span> 4. Hydraulic Adequacy <span style="float: right;"><b>8</b></span>
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Actual Posting      H    3    3S2      Single <b>NA</b> <b>NA</b> <b>NA</b> <b>NA</b> Recommended Posting From Rating Book <b>29</b> <b>40</b> <b>48</b> <input type="checkbox"/> SIGNS IN PLACE      at bridge      advance Y or N <b>NA</b> <b>NA</b> LEGIBILITY <b>NA</b> <b>NA</b>	Overhead Signs (attached to bridge) <input type="checkbox"/> yes <input checked="" type="checkbox"/> no 1. Welds <span style="float: right;"><input type="checkbox"/></span> 2. Bolts <span style="float: right;"><input type="checkbox"/></span> 3. Condition <span style="float: right;"><input type="checkbox"/></span>
Item 93b    U/W Inspection Date: _____	

<b>ITEM 61-channel and channel protection</b> <span style="float: right;"><b>8</b></span> 1. channel scour <span style="float: right;"><b>8</b></span> 2. embankment erosion <span style="float: right;"><b>7</b></span> 3. fender system <span style="float: right;"><b>NA</b></span> 4. spur dikes & jetties <span style="float: right;"><b>NA</b></span> 5. rip rap or slope paving <span style="float: right;"><b>NA</b></span> 6. effectiveness <span style="float: right;"><b>8</b></span> 7. debris <span style="float: right;"><b>7</b></span> 8. vegetation <span style="float: right;"><b>8</b></span>	<b>36-Traffic Safety features</b> 36      condition 1. bridge railing <del>PARAPET</del> <span style="float: right;"><b>1</b></span> <span style="float: right;"><b>8</b></span> 2. transitions <span style="float: right;"><b>1</b></span> <span style="float: right;"><b>8</b></span> 3. approach guardrail <span style="float: right;"><b>1</b></span> <span style="float: right;"><b>8</b></span> 4. guardrail terminal <span style="float: right;"><b>1</b></span> <span style="float: right;"><b>8</b></span>
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**X=UNKNOWN      NA=NOT APPLICABLE      IA=INACCESSIBLE**

# NBI Metric Structural Inventory and Appraisal

Date Printed: 09/02/98

(202) Corps of Engineers Structure Number: CEPNEDMA2510009

(8) NBI Structure Number: CEPNEDMA2510009

## Geographic and Route Data

## Dimensional Data

## Inspection Data

(1) State Massachusetts  
(2) District 00  
(3) County 000  
(4) Place 00000  
(6) Feature Under SPILLWAY CHANNEL  
(7) Facility on MA ROUTE 32  
(9) Location 4.8 KM NORTH OF ATHOL  
(16) Latitude 42° 40' 00.00"  
(17) Longitude 072° 15' 00.00"  
(98) Border Bridge  
(99) Border Bridge Str No  
(103) Temporary Str

(32) Approach Rdwy Width 6.7 M  
(39) Navigation Vert Clr 0.0 M  
(40) Navigation Horz Clr 0.0 M  
(48) Max Span Length 0020.7 M  
(49) Str Length 00020.7 M  
(50) Curb/Sidewalk Width Left 00.9 M  
Right 00.9 M  
(51) Brg Rdwy Width, curb-curb 006.7 M  
(52) Deck Width out-out 008.5 M  
(53) Min Vert Clr over 99.99 M  
(54) Min Vert Clr under N 00.00 M  
(55) Min Lat Underclr R N 00.0 M  
(56) Min Lat Underclr L 99.9 M  
(112) NBIS Bridge Length Y  
(116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0498  
(91) Inspection Frequency 24 Mo  
(92) Critical Feature Insp (93) Date  
Frac Crit Insp : N 00 /  
Underwater Insp: N 00 /  
Other Spec Insp: N 00 /

## On and Under Record Data

## Route On

(5) Inventory Route 168000000  
(10) Min Vert Clr 99.99 M  
(11) Kilometer Point 0000.000  
(19) Detour Length 013 km  
(20) Toll 3  
(26) Func Class 09  
(28) Lanes on/under 0200  
(29) ADT 500  
(30) Year of ADT 1998  
(47) Total Horz Clearance 06.7 M  
(100) Defense Hwy 0  
(101) Parallel Str N  
(102) Direction of Traffic 2  
(104) Hwy System 0  
(109) Truck Traffic 02%  
(110) Natl Truck Network No

## Proposed Improvements

(75) Type of Work  
(76) Improvement Length 000000 M  
(94) Bridge Improv Cost 0  
(95) Rdwy Improv Cost 0  
(96) Total Proj Cost 0  
(97) Year of Cost Est 0000  
(114) Future ADT 500  
(115) Year of Future ADT 2015

## Condition Rating

(58) Deck 7  
(59) Superstructure 8  
(60) Substructure 7  
(61) Channel & Channel Protect 8  
(62) Culverts N

## General Data

(21) Maintenance Responsibility 70  
(22) Owner 70  
(31) Design Load 2  
(33) Bridge Median 0  
(34) Skew 00 deg  
(35) Str Flared No  
(37) Hist Significance 5  
(38) Navigation Control N  
(42) Type of Service 59  
(43) Structure Type Main 111  
(44) Structure Type Approach 000  
(45) No of Span Main 001  
(46) No of Approach Spans 0000  
(27) Year Built 1948  
(106) Year Reconstructed 0000  
(107) Deck Str Type 1  
(108) Wear Surf/Protv Sys 000  
(111) Nav Pier/Abut Protection

## Appraisal Rating

(67) Structure Evaluation 6  
(68) Deck Geometry 4  
(69) Underclrn Vert & Horz N  
(71) Waterway Adequacy 9  
(72) Approach Rdwy Alignment 9  
(36) Traffic Safety Features 1111  
(113) Scour Critical Bridges 8

## Load Rate and Post

(41) Str Open/Post/Close Open  
(64) Operating Rating 44.5 ton  
(66) Inventory Rating 26.3 ton  
(70) Bridge Posting 5

## Over 200 Items

(200) COE MSC CENAD  
(201) COE District CENAE  
(202) Structure Number CEPNEDMA2510009  
(203) Inspection Office EPDG  
(204) Inspector JOE COLUCCI  
(205) Inspection Cost 007000  
(206) Cooper's Loading  
(207) Railroad Stru Number  
(208) Name of Railroad  
(209) Recommended Speed Limit  
(210) Posted Speed Limit (KPH)  
(211) MACOM  
(212) Installation Name  
(213) Military Wheel Load Class  
(214) Military Truck Load Class  
(215) Installation Number  
(216) Seismic Category  
(217) Acceleration Coefficient 0.00  
(218) Soil Site Coefficient 0.0

Sufficiency Rating = 077.7

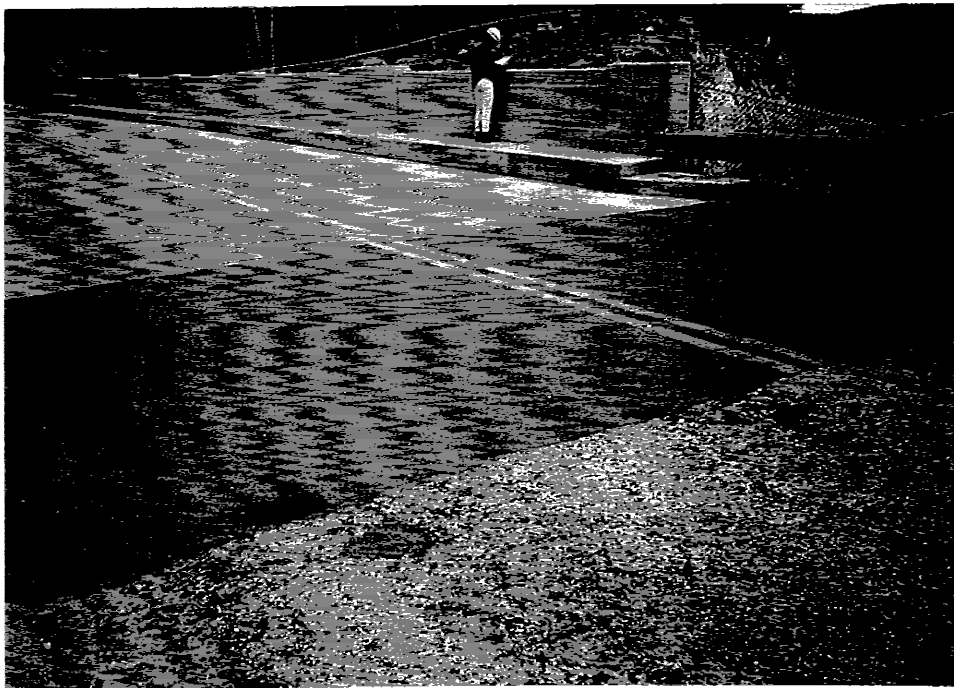


Photo 1: View of the south approach roadway.

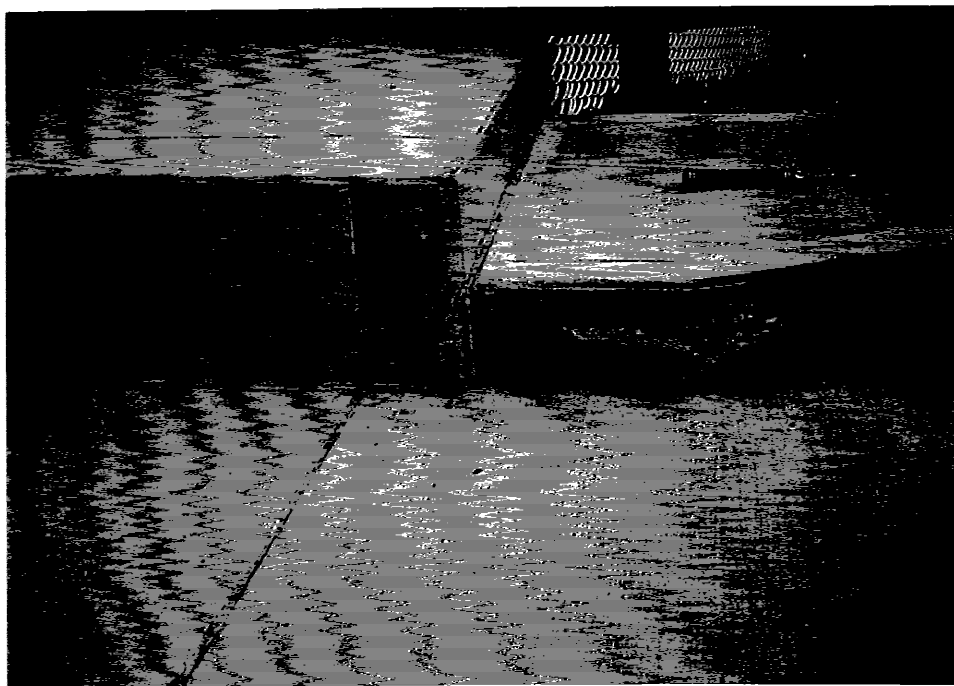


Photo 2: Crack at the southeast curb.

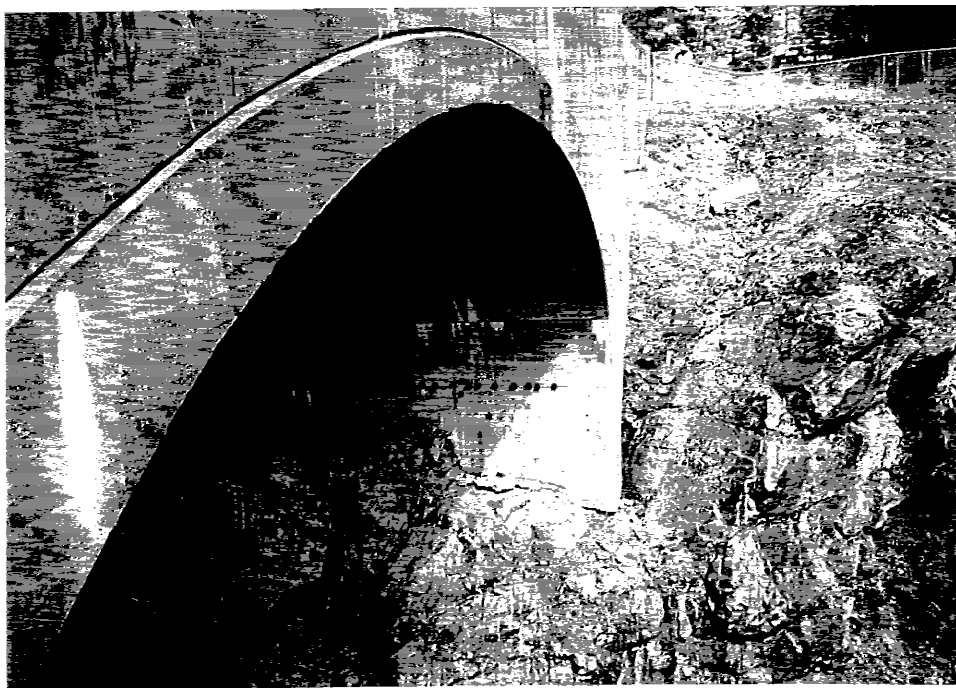


Photo 3: View of the north abutment. *Note the moderate efflorescence at the horizontal joint; the corroded drains; and the undercutting of the arch base at the northeast corner.*



Photo 4: Concrete deterioration at the joint between the arch and the north abutment base. *Note also the efflorescence leaching at the joint.*

BARRE FALLS DAM  
PINE PLAINS BRIDGE  
HUBBARDSTON, MASSACHUSETTS  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

30 April 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection,	20	Aug	96
Routine Inspection,	1	Sept	94
Routine Inspection,	17	June	92
Routine Inspection,	6	Sept	90
Inventory Inspection,	4	Oct	84

BRIDGE DESCRIPTION AND HISTORY

The Pine Plains Bridge over Muddy Pond Brook in the Barre Falls Reservoir area of Oakham, Massachusetts is a double span metal plate arch bridge. The bridge was built in 1938 and record plans are available in the files of the Massachusetts Department of Public Works.

The span length of each arch is 14'-5", and the rise is 4'-0 1/2". The total length of the deck is 54'-7". The roadway width across the bridge is 20'-0" between 1'-6" wide x 1'-8" high concrete brush blocks. There are 2'-4" high steel handrails on both sides consisting of two steel pipe rails spaced at 1'-0" vertically and 4" flange posts.

Each arch consists of several bolted plates supporting the concrete brush blocks and earth fill. The substructure consists of concrete abutments, headwalls, a pier, and wingwalls.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	246T	351T	No change in rating.
3	290T	411T	
3S2	456T	648T	
3-3	562T	720T	

EVALUATION (See attached "Structures Inspection Field Report")

A. Approach Roadway

There are no guardrails at either the west and east approach roadways. The alignment is good in both directions. The gravel wearing surface is in good condition with no depressions at either of the approaches. There is a speed limit sign at the east approach roadway.

B. Deck

The overall condition of the deck is good. The gravel wearing surface is in good condition with no depressions. Vegetation is noted at both the north and south edges of the bridge deck. The guardrails are in overall good condition. Map cracking with efflorescence is noted at both curbs. Three areas of concrete delamination were noted at the south curb. An area of unsound concrete measuring 80" long x 16" wide x 8" deep is located between the third and fourth post locations from the west abutment. Another area measuring 30" x 16" x 8" is located between the second and third post locations from the west abutment. At this second post location, there is an area of 27" x 16" of unsound concrete with moss growing from inside the concrete curb. At the north curb, there is unsound concrete for the entire section between the second and third post locations from the east abutment.

C. Superstructure

Both the metal plate arches are in good condition and show no signs of corrosion. Both the north and south headwalls of the west arch are delaminating and there are cracks with efflorescence at both headwalls. The north headwall of the east arch is experiencing map cracking with efflorescence at the entire area above and to the right (looking at the headwall) of the rim. No signs of deterioration are noted at the south headwall of the east arch.

D. Substructure

The footing of the west arch is being undercut at the west abutment at the north end due to upstream buildup diverting flow directly to this corner. The undermined area measures 3' x 1' x 1 1/2' deep. There is an approximately 10' length of spalled concrete at the pier of the east arch at the north end. At the south end of this same pier, there is a spall measuring 4' x 1'. The footing of the east arch at the east abutment at the north end is being undercut resulting in a spall measuring 2' x 1' x 8" deep. Towards the south end of this abutment, there is abrasion



of the footing measuring up 6" high. Near this abrasion, there is a spall of 3' x 1' x 8" deep. Weepholes remain plugged.

#### E. Channel

Debris and silt buildup is present both upstream and downstream of the bridge. There is uniform silt buildup for the entire length of the west arch. At the east arch, there is extensive silt buildup at the pier. Overgrowth of trees and vegetation are typical at both the upstream and downstream channels.

#### CONDITION RATING

Routine, 1998	5
Routine, 1996	6
Routine, 1994	6
Routine, 1992	7
Routine, 1990	7
Inventory, 1984	7

#### RECOMMENDATIONS

##### A. Status of Previous Recommendations

Restore the channel profile to its original configuration by removing all broken tree branches, deposited silt, and vegetation overgrowth.

Repair spall areas at the east arch substructure and at the south curb.

Remove all the vegetation on the gravel bridge deck and unplug all the weepholes along the downstream.

No recommendations were performed.

##### B. Revised Recommendations

Perform previous recommendations.

In addition to previous recommendations, repair all areas of concrete deterioration at both curbs, at the headwalls, and at the substructure.

##### Estimated Cost:

Channel Restoration	\$25,000.00
Concrete Repairs	\$15,000.00
Vegetation Removal/Weephole cleaning	\$2,000.00

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>OAKHAM, MA</b>		bridge dept. no.		8-structure no. <b>CEPNEDMA2510012</b>		90-date inspected <b>30 APRIL 98</b>	
st. <b>0 - NOT ON NHS</b>	104-highway system <b>0 - NOT ON NHS</b>	22-owner <b>ARMY CORPS OF ENGINEERS</b>	27-year built <b>1938</b>	106-year rebuilt		11-milepoint	
43-structure type <b>311 - TWO SPAN STEEL PLATE DECK ARCH</b>				quality control engineer <b>NICK FORBES</b>			
07-facility carried <b>PINE PLAINS RD</b>				team leader <b>JOE COLUCCI</b>			
06-features intersected <b>MUDDY POND BROOK</b>				team members <b>JENNIFER LEE ; ED HILLS</b>			

<b>item 58</b> <span style="float: right;"><b>7</b></span> <b>DECK</b> 1. Wearing Surface <span style="float: right;"><b>7</b></span> 2. Deck-Condition <span style="float: right;"><b>NA</b></span> 3. Stay in Place Forms <span style="float: right;"><b>NA</b></span> 4. Curbs <span style="float: right;"><b>5</b></span> 5. Median <span style="float: right;"><b>NA</b></span> 6. Sidewalks <span style="float: right;"><b>NA</b></span> 7. Parapet <span style="float: right;"><b>NA</b></span> 8. Railing <span style="float: right;"><b>7</b></span> 9. Anti Missile Fence <span style="float: right;"><b>NA</b></span> 10. Drains <span style="float: right;"><b>NA</b></span> 11. Lighting Standards <span style="float: right;"><b>NA</b></span> 12. Utilities <span style="float: right;"><b>NA</b></span> 13. Deck Joints <span style="float: right;"><b>NA</b></span> 14. Approach Settlement <span style="float: right;"><b>7</b></span>	<b>item 59</b> <span style="float: right;"><b>8</b></span> <b>SUPERSTRUCTURE</b> 1. Bearing Devices <span style="float: right;"><b>NA</b></span> 2. <del>Stringers</del> <b>ARCHES</b> <span style="float: right;"><b>8</b></span> 3. Diaphragms <span style="float: right;"><b>NA</b></span> 4. Girders or Beams <span style="float: right;"><b>NA</b></span> 5. Floor Beams <span style="float: right;"><b>NA</b></span> 6. Trusses <span style="float: right;"><b>NA</b></span> 7. Rivets or Bolts <span style="float: right;"><b>8</b></span> 8. Welds <span style="float: right;"><b>NA</b></span> 9. Collision Damage <span style="float: right;"><b>8</b></span> 10. Load Deflection <span style="float: right;"><b>8</b></span> 11. Member Alignment <span style="float: right;"><b>8</b></span> 12. Load Vibration <span style="float: right;"><b>8</b></span> 13. Paint-Epoxy <span style="float: right;"><b>NA</b></span> 14. Year Painted <span style="float: right;"><b>NA</b></span> 15. Under Clearance _____ ft _____ in Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<b>item 60</b> <span style="float: right;"><b>5</b></span> <b>SUBSTRUCTURE</b> 1. Abutments a-Wings <span style="float: right;"><b>7</b></span> b-Backwall <span style="float: right;"><b>NA</b></span> c-Bridge Seats <span style="float: right;"><b>NA</b></span> d-Breastwall <span style="float: right;"><b>NA</b></span> e-Footings <span style="float: right;"><b>5</b></span> f-Piles <span style="float: right;"><b>NA</b></span> g-Erosion <span style="float: right;"><b>6</b></span> h-Settlement <span style="float: right;"><b>7</b></span> 2. Piers or Bents a-Caps <span style="float: right;"><b>NA</b></span> b-Column <span style="float: right;"><b>NA</b></span> c-Web <span style="float: right;"><b>NA</b></span> d-Footing <span style="float: right;"><b>5</b></span> e-Piles <span style="float: right;"><b>NA</b></span> f-Scour <span style="float: right;"><b>5</b></span> g-Settlement <span style="float: right;"><b>NA</b></span> 3. Collision Damage <span style="float: right;"><b>8</b></span> 4. Hydraulic Adequacy <span style="float: right;"><b>5</b></span>
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Actual Posting <span style="float: right;">H 3 3S2</span> <div style="display: flex; justify-content: space-around;"> <span><b>N</b> <b>N</b> <b>N</b></span> <span><b>N</b></span> </div>	Single <div style="text-align: center;"><b>N</b></div>	Overhead Signs (attached to bridge) <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Recommended Posting From Rating Book <div style="display: flex; justify-content: space-around;"> <span><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></span> <span><input type="checkbox"/></span> </div>	<div style="text-align: center;"><input type="checkbox"/></div>	1. Welds <div style="float: right;"><input type="checkbox"/></div> 2. Bolts <div style="float: right;"><input type="checkbox"/></div> 3. Condition <div style="float: right;"><input type="checkbox"/></div>
SIGNS IN PLACE Y or N <span style="float: right;"><b>N</b></span>	at bridge <span style="float: right;"><b>N</b></span> advance <span style="float: right;"><b>N</b></span>	
LEGIBILITY <span style="float: right;"><b>NA</b></span>	<span style="float: right;"><b>NA</b></span>	

<b>ITEM 61-channel and channel protection</b> <span style="float: right;"><b>5</b></span> 1. channel scour <span style="float: right;"><b>7</b></span> 2. embankment erosion <span style="float: right;"><b>7</b></span> 3. fender system <span style="float: right;"><b>NA</b></span> 4. spur dikes & jetties <span style="float: right;"><b>NA</b></span> 5. rip rap or slope paving <span style="float: right;"><b>NA</b></span> 6. effectiveness <span style="float: right;"><b>5</b></span> 7. debris <span style="float: right;"><b>5</b></span> 8. vegetation <span style="float: right;"><b>5</b></span>	<b>36-Traffic Safety features</b> <div style="display: flex; justify-content: space-between;"> <div>           1. bridge railing <span style="float: right;"><b>1</b></span>            2. transitions <span style="float: right;"><b>0</b></span>            3. approach guardrail <span style="float: right;"><b>0</b></span>            4. guardrail terminal <span style="float: right;"><b>0</b></span> </div> <div>           36 condition  <b>7</b>  <b>-</b>  <b>-</b>  <b>-</b> </div> </div>
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**X=UNKNOWN**
**NA=NOT APPLICABLE**
**IA=INACCESSIBLE**

PROJECT: BARRE FALLS DAM  
NAME: PINE PLAINS BRIDGE  
LOCATION: OALHAM, MA

BRIDGE INSPECTION  
SCOUR CHECKLIST

1. Is the bridge currently experiencing, or does it have a history of, scour activity?

YES

2. Is the streambed erodible? If so, does the structure have any vulnerable design features?

YES

- a. Piers, abutments with spread footings or short pile foundations.
- b. Superstructure with simple spans or non-redundant support systems.
- c. Inadequate waterway openings.
- d. Designs which collect ice and debris.
- e. All water must pass through or over structure.
- f. Other.

YES

NO

NO

NO

YES

—

3. Are any characteristics of an aggressive stream or waterway present?

YES

YES

- a. Active degradation or aggradation of streambed.
- b. Significant lateral movement or erosion of streambanks.
- c. Steep slopes.
- d. High velocities.
- e. Any history of highway or bridge damage during past floods.
- f. Other.

NO

NO

NO

NO

NO

—

4. Is the bridge located on a stream reach with any adverse flow characteristics?

NO

NO

NO

NO

NO

NO

NO

5. Other comments or observations.

YES

SILT AND DEBRIS ARE ACCUMULATING AT BOTH UPSTREAM AND DOWNSTREAM OF THE BRIDGE. SILT BUILDUP IS PRESENT IN THE CHANNEL BENEATH BOTH ARCHES. THE FOOTINGS AT BOTH ABUTMENTS AND AT THE PIER ARE EXPERIENCING SCOUR AND ARE DETERIORATING. VEGETATION GROWTH AT BOTH UPSTREAM AND DOWNSTREAM OF BRIDGE.

NBI Metric Structural Inventory and Appraisal

Date Printed: 09/02/98

(202) Corps of Engineers Structure Number: CEPNEDMA2510012

(8) NBI Structure Number: CEPNEDMA2510012

Geographic and Route Data

Dimensional Data

Inspection Data

(1) State Massachusetts  
(2) District 00  
(3) County 000  
(4) Place 00000  
(6) Feature Under MUDDY POND BROOK  
(7) Facility on PINE PLAINS ROAD  
(9) Location 12.9 KM S OF GARDNER  
(16) Latitude 42° 23' 06.00"  
(17) Longitude 072° 01' 18.00"  
(98) Border Bridge  
(99) Border Bridge Str No  
(103) Temporary Str

(32) Approach Rdwy Width 6.1 M  
(39) Navigation Vert Clr 0.0 M  
(40) Navigation Horz Clr 0.0 M  
(48) Max Span Length 0004.4 M  
(49) Str Length 00016.6 M  
(50) Curb/Sidewalk Width Left 00.5 M  
Right 00.5 M  
(51) Brg Rdwy Width, curb-curb 006.1 M  
(52) Deck Width out-out 007.1 M  
(53) Min Vert Clr over 99.99 M  
(54) Min Vert Clr under N 00.00 M  
(55) Min Lat Underclr R N 00.0 M  
(56) Min Lat Underclr L 99.9 M  
(112) NBIS Bridge Length Y  
(116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0498  
(91) Inspection Frequency 24 Mo  
(92) Critical Feature Insp (93) Date  
Frac Crit Insp : N 00 /  
Underwater Insp: N 00 /  
Other Spec Insp: N 00 /

On and Under Record Data

Route On  
(5) Inventory Route 168000000  
(10) Min Vert Clr 99.99 M  
(11) Kilometer Point 0000.000  
(19) Detour Length 002 km  
(20) Toll 3  
(26) Func Class 09  
(28) Lanes on/under 0200  
(29) ADT 20  
(30) Year of ADT 1998  
(47) Total Horz Clearance 06.1 M  
(100) Defense Hwy 0  
(101) Parallel Str N  
(102) Direction of Traffic 2  
(104) Hwy System 0  
(109) Truck Traffic 00%  
(110) Natl Truck Network No

Proposed Improvements  
(75) Type of Work 381  
(76) Improvement Length 000166 M  
(94) Bridge Improv Cost 42  
(95) Rdwy Improv Cost 0  
(96) Total Proj Cost 42  
(97) Year of Cost Est 1998  
(114) Future ADT 20  
(115) Year of Future ADT 2015

Condition Rating

(58) Deck 7  
(59) Superstructure 8  
(60) Substructure 5  
(61) Channel & Channel Protect 5  
(62) Culverts N

General Data

(21) Maintenance Responsibility 70  
(22) Owner 70  
(31) Design Load 2  
(33) Bridge Median 0  
(34) Skew 00 deg  
(35) Str Flared No  
(37) Hist Significance 5  
(38) Navigation Control 0  
(42) Type of Service 55  
(43) Structure Type Main 311  
(44) Structure Type Approach 000  
(45) No of Span Main 002  
(46) No of Approach Spans 0000  
(27) Year Built 1938  
(106) Year Reconstructed 0000  
(107) Deck Str Type 9  
(108) Wear Surf/Protv Sys 800  
(111) Nav Pier/Abut Protection

Appraisal Rating

(67) Structure Evaluation 5  
(68) Deck Geometry 5  
(69) Underclrn Vert & Horz N  
(71) Waterway Adequacy 6  
(72) Approach Rdwy Alignment 9  
(36) Traffic Safety Features 1000  
(113) Scour Critical Bridges 8

Load Rate and Post

(41) Str Open/Post/Close Open  
(64) Operating Rating 99.9 ton  
(66) Inventory Rating 99.9 ton  
(70) Bridge Posting 5

Over 200 Items

(200) COE MSC CENAD  
(201) COE District CENAE  
(202) Structure Number CEPNEDMA2510012  
(203) Inspection Office EPDG  
(204) Inspector JOE COLUCCI  
(205) Inspection Cost 006000  
(206) Cooper's Loading  
(207) Railroad Stru Number  
(208) Name of Railroad  
(209) Recommended Speed Limit  
(210) Posted Speed Limit (KPH)  
(211) MACOM  
(212) Installation Name  
(213) Military Wheel Load Class  
(214) Military Truck Load Class  
(215) Installation Number  
(216) Seismic Category  
(217) Acceleration Coefficient 0.00  
(218) Soil Site Coefficient 0.0

Sufficiency Rating = 086.0



Photo 1: Pine Plains Bridge deck. *Note the lack of approach roadway guardrails, the debris at the edges of the bridge deck, and the good condition of the gravel wearing surface.*



Photo 2: An area of concrete delamination at the south curb.



Photo 3: The headwall above the west metal plate arch. Note the numerous cracks with efflorescence and most of the concrete of the headwall is unsound.



Photo 4: A spall, measuring 3' x 1' x 1 1/2', at the footing of the west arch located at the north end of the west abutment.

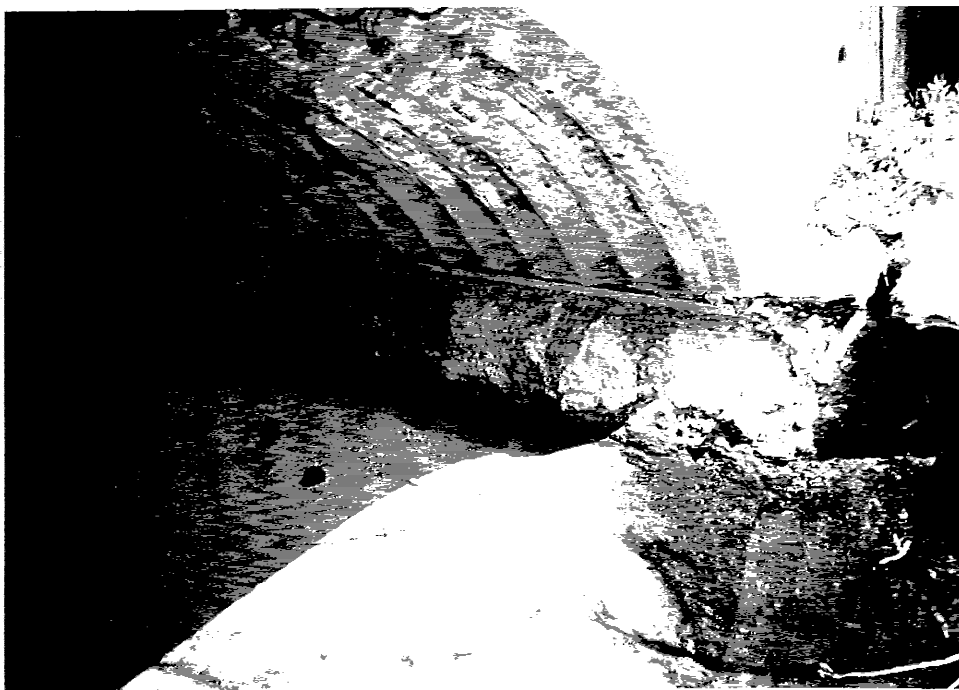


Photo 5: Approximately 10' long of spalled concrete at the pier for the east arch at the north end.



Photo 6: Upstream view of the channel. Note the silt buildup in the middle, diverting the flow of the channel.

WESTVILLE LAKE  
OLD MASHPAUG ROAD BRIDGE  
STURBRIDGE, MASSACHUSETTS  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

29 May 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection, 2 May 96  
Routine Inspection, 2 June 94  
Routine Inspection, 26 Aug 92  
Routine Inspection, 22 Aug 90  
Inventory Inspection, 11 July 85

BRIDGE DESCRIPTION AND HISTORY

The bridge, built in 1956, is a single span, composite steel stringer structure. The bridge carries Old Mashpaug Road over the Quinebaug River at the Westville Reservoir in Sturbridge, Massachusetts. The span length is 80'-0", and the roadway is 26'-0" wide, consisting of two 12'-0" travel lanes and two 1'-0" shoulders.

The superstructure consists of five wide flange rolled beams spaced at 6'-10 1/2" on center. All beams are 36WF194 sections with bottom cover plates. The interior beam cover plates are 8" x 1" x 54'-0" long. Exterior beam cover plates are 8" x 3/4" x 51'-0" long. The beams support an 8" thick reinforced concrete deck slab. The substructure consists of unreinforced gravity abutments with flared wingwalls on spread footings.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	20T	31T	No change in rating.
3	22T	45T	
3S2	27T	55T	

EVALUATION (See attached "Structures Inspection Field Report")

A. Approach Roadway

The bituminous paving at both the east and west approaches was replaced in 1995 and is still in good condition. The transition



to the deck is good at both ends. The expansion joint plate at the east approach is in good condition with no signs of rust. The alignment at both approaches is poor due to the nearly 90° angle between the bridge deck and the approach roads. The bridge is load posted at both approaches. Overall, the approach guardrails are in good condition, with areas of rust noted. There is a bent rail at the westernmost rail at the west approach and the north east rail near the bridge deck. None of the approach rails are attached to the bridge deck rails.

#### B. Deck

The overall condition of the deck is good. There is a minor amount of sand at the edges of the deck and at the expansion joint. The concrete parapets which form the bridge rail system are in overall good condition. Exposed aggregate is noted at the top rail at the north side.

#### C. Superstructure

Overall, the steel superstructure and the bearings are in very good condition. Some areas of rust were noted at the bottom flange of the steel beams. Debris has accumulated at the east bearings and seat.

#### D. Substructure

The east and west abutments and wingwalls are in good condition with no deficiencies noted.

#### E. Channel

Channel alignment is good with no noticeable obstruction to flow. Although no scour problems have been noted during past inspection, water levels during this inspection were too high to inspect the abutments for scour.

#### CONDITION RATING

Routine, 1998	8
Routine, 1996	8
Routine, 1994	7
Routine, 1992	7
Routine, 1990	7
Inventory, 1985	7

## RECOMMENDATIONS

### A. Status of Previous Recommendations

No previous recommendations.

### B. Revised Recommendations

No new recommendations.

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>STURBRIDGE, MA</b>		bridge dept. no.		8-structure no. <b>CEPNEDMA2510006</b>		90-date inspected <b>29 MAY 1998</b>	
st.	104-highway system <b>0 - NOT ON NHS</b>	22-owner <b>ARMY CORPS OF ENGINEERS</b>		27-year built <b>1956</b>	106-year rebuilt <b>---</b>	11-milepoint <b>---</b>	
43-structure type <b>302 - STEEL STRINGER</b>				quality control engineer <b>NICK FORBES</b>			
07-facility carried <b>OLD MASHPAUG RD.</b>				team leader <b>JOE COLUCCI</b>			
06-features intersected <b>QUINEBAUG RIVER</b>				team members <b>JENNIFER LEE ; CHINAY HSIUNG</b>			

<p>item 58 <span style="float: right;"><b>8</b></span></p> <p>DECK</p> <ul style="list-style-type: none"> <li>1. Wearing Surface <span style="float: right;"><b>8</b></span></li> <li>2. Deck-Condition <span style="float: right;"><b>8</b></span></li> <li>3. Stay in Place Forms <span style="float: right;"><b>NA</b></span></li> <li>4. Curbs <span style="float: right;"><b>8</b></span></li> <li>5. Median <span style="float: right;"><b>NA</b></span></li> <li>6. Sidewalks <span style="float: right;"><b>NA</b></span></li> <li>7. Parapet <span style="float: right;"><b>8</b></span></li> <li>8. Railing <span style="float: right;"><b>8</b></span></li> <li>9. Anti Missile Fence <span style="float: right;"><b>NA</b></span></li> <li>10. Drains <span style="float: right;"><b>NA</b></span></li> <li>11. Lighting Standards <span style="float: right;"><b>NA</b></span></li> <li>12. Utilities <span style="float: right;"><b>NA</b></span></li> <li>13. Deck Joints <span style="float: right;"><b>8</b></span></li> <li>14. Approach Settlement <span style="float: right;"><b>8</b></span></li> </ul>	<p>item 59 <span style="float: right;"><b>8</b></span></p> <p>SUPERSTRUCTURE</p> <ul style="list-style-type: none"> <li>1. Bearing Devices <span style="float: right;"><b>8</b></span></li> <li>2. Stringers <span style="float: right;"><b>NA</b></span></li> <li>3. Diaphragms <span style="float: right;"><b>8</b></span></li> <li>4. Girders or Beams <span style="float: right;"><b>7</b></span></li> <li>5. Floor Beams <span style="float: right;"><b>NA</b></span></li> <li>6. Trusses <span style="float: right;"><b>NA</b></span></li> <li>7. Rivets or Bolts <span style="float: right;"><b>8</b></span></li> <li>8. Welds <span style="float: right;"><b>8</b></span></li> <li>9. Collision Damage <span style="float: right;"><b>8</b></span></li> <li>10. Load Deflection <span style="float: right;"><b>8</b></span></li> <li>11. Member Alignment <span style="float: right;"><b>8</b></span></li> <li>12. Load Vibration <span style="float: right;"><b>8</b></span></li> <li>13. Paint-Epoxy <span style="float: right;"><b>7</b></span></li> <li>14. Year Painted <span style="float: right;"><b>95</b></span></li> <li>15. Under Clearance <span style="float: right;">_____ ft _____ in</span></li> <li>Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no</li> </ul>	<p>item 60 <span style="float: right;"><b>7</b></span></p> <p>SUBSTRUCTURE</p> <ul style="list-style-type: none"> <li>1. Abutments <ul style="list-style-type: none"> <li>a-Wings <span style="float: right;"><b>7</b></span></li> <li>b-Backwall <span style="float: right;"><b>7</b></span></li> <li>c-Bridge Seats <span style="float: right;"><b>7</b></span></li> <li>d-Breastwall <span style="float: right;"><b>7</b></span></li> <li>e-Footings <span style="float: right;"><b>7</b></span></li> <li>f-Piles <span style="float: right;"><b>7</b></span></li> <li>g-Erosion <span style="float: right;"><b>7</b></span></li> <li>h-Settlement <span style="float: right;"><b>7</b></span></li> </ul> </li> <li>2. Piers or Bents <ul style="list-style-type: none"> <li>a-Caps <span style="float: right;"><b>NA</b></span></li> <li>b-Column <span style="float: right;"><b>NA</b></span></li> <li>c-Web <span style="float: right;"><b>NA</b></span></li> <li>d-Footing <span style="float: right;"><b>NA</b></span></li> <li>e-Piles <span style="float: right;"><b>NA</b></span></li> <li>f-Scour <span style="float: right;"><b>NA</b></span></li> <li>g-Settlement <span style="float: right;"><b>NA</b></span></li> </ul> </li> <li>3. Collision Damage <span style="float: right;"><b>8</b></span></li> <li>4. Hydraulic-Adequacy <span style="float: right;"><b>8</b></span></li> </ul>
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<p>Actual Posting <span style="float: right;">H 3 3S2</span></p> <p style="text-align: center;"><b>20 22 27</b></p> <p>Recommended Posting From Rating Book <span style="float: right;">H 3 3S2</span></p> <p style="text-align: center;"><b>20 22 27</b></p> <p>SIGNS IN PLACE at bridge advance</p> <p>Y or N <span style="float: right;"><b>N</b></span> <span style="float: right;"><b>Y</b></span></p> <p>LEGIBILITY <span style="float: right;"><b>NA</b></span> <span style="float: right;"><b>8</b></span></p>	<p>Overhead Signs (attached to bridge)</p> <p><input type="checkbox"/> yes <input checked="" type="checkbox"/> no</p> <ul style="list-style-type: none"> <li>1. Welds <span style="float: right;"><input type="checkbox"/></span></li> <li>2. Bolts <span style="float: right;"><input type="checkbox"/></span></li> <li>3. Condition <span style="float: right;"><input type="checkbox"/></span></li> </ul> <p>Item 93b U/W Inspection Date: _____</p>
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<p>ITEM 61-channel and channel protection <span style="float: right;"><b>8</b></span></p> <ul style="list-style-type: none"> <li>1. channel scour <span style="float: right;"><b>8</b></span></li> <li>2. embankment erosion <span style="float: right;"><b>8</b></span></li> <li>3. fender system <span style="float: right;"><b>NA</b></span></li> <li>4. spur dikes &amp; jetties <span style="float: right;"><b>NA</b></span></li> <li>5. rip rap or slope paving <span style="float: right;"><b>NA</b></span></li> <li>6. effectiveness <span style="float: right;"><b>8</b></span></li> <li>7. debris <span style="float: right;"><b>8</b></span></li> <li>8. vegetation <span style="float: right;"><b>8</b></span></li> </ul>	<p>36-Traffic Safety features</p> <table style="width: 100%;"> <tr> <td style="width: 50%;"> <ul style="list-style-type: none"> <li>1. bridge railing <span style="float: right;"><b>1</b></span></li> <li>2. transitions <span style="float: right;"><b>0</b></span></li> <li>3. approach guardrail <span style="float: right;"><b>1</b></span></li> <li>4. guardrail terminal <span style="float: right;"><b>1</b></span></li> </ul> </td> <td style="width: 50%;"> <p>36 condition</p> <ul style="list-style-type: none"> <li><b>7</b></li> <li><b>-</b></li> <li><b>8</b></li> <li><b>7</b></li> </ul> </td> </tr> </table>	<ul style="list-style-type: none"> <li>1. bridge railing <span style="float: right;"><b>1</b></span></li> <li>2. transitions <span style="float: right;"><b>0</b></span></li> <li>3. approach guardrail <span style="float: right;"><b>1</b></span></li> <li>4. guardrail terminal <span style="float: right;"><b>1</b></span></li> </ul>	<p>36 condition</p> <ul style="list-style-type: none"> <li><b>7</b></li> <li><b>-</b></li> <li><b>8</b></li> <li><b>7</b></li> </ul>
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**X=UNKNOWN**      **NA=NOT APPLICABLE**      **IA=INACCESSIBLE**

PROJECT: WESTVILLE LAKE  
NAME: OLD MASHPAUG ROAD  
LOCATION: STURBRIDGE, MA

BRIDGE INSPECTION  
SCOUR CHECKLIST

1. Is the bridge currently experiencing, or does it have a history of, scour activity? NO
2. Is the streambed erodible? If so, does the structure have any vulnerable design features? YES
- a. Piers, abutments with spread footings or short pile foundations. YES
- b. Superstructure with simple spans or non-redundant support systems. YES
- c. Inadequate waterway openings. NO
- d. Designs which collect ice and debris. NO
- e. All water must pass through or over structure. YES
- f. Other. NO
3. Are any characteristics of an aggressive stream or waterway present? YES
- a. Active degradation or aggradation of streambed. NO
- b. Significant lateral movement or erosion of streambanks. NO
- c. Steep slopes. NO
- d. High velocities. YES
- e. Any history of highway or bridge damage during past floods. NO
- f. Other. NO
4. Is the bridge located on a stream reach with any adverse flow characteristics? NO
- a. Crossing near stream confluence. NO
- b. Crossing of tributary stream near confluence with larger streams. NO
- c. Crossing on sharp bend in stream. NO
- d. Location on alluvial fan. NO
- e. Other. —
5. Other comments or observations. —

NBI Metric Structural Inventory and Appraisal

Date Printed: 09/02/98

(202) Corps of Engineers Structure Number: CEPNEDMA2510006

(8) NBI Structure Number: CEPNEDMA2510006

Geographic and Route Data

Dimensional Data

Inspection Data

(1) State Massachusetts  
(2) District 00  
(3) County 000  
(4) Place 00000  
(6) Feature Under QUINEBAUG RIVER  
(7) Facility on OLD MASHPAUG ROAD  
(9) Location 29 KM SW OF WORCESTER  
(16) Latitude 42° 04' 18.00"  
(17) Longitude 072° 04' 12.00"  
(98) Border Bridge  
(99) Border Bridge Str No  
(103) Temporary Str

(32) Approach Rdwy Width 7.9 M  
(39) Navigation Vert Clr 0.0 M  
(40) Navigation Horz Clr 0.0 M  
(48) Max Span Length 0024.4 M  
(49) Str Length 00024.4 M  
(50) Curb/Sidewalk Width Left 00.7 M  
Right 00.7 M  
(51) Brg Rdwy Width, curb-curb 007.9 M  
(52) Deck Width out-out 009.3 M  
(53) Min Vert Clr over 99.99 M  
(54) Min Vert Clr under N 00.00 M  
(55) Min Lat Underclr R N 00.0 M  
(56) Min Lat Underclr L 99.9 M  
(112) NBIS Bridge Length Y  
(116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0598  
(91) Inspection Frequency 24 Mo  
(92) Critical Feature Insp (93) Date  
Frac Crit Insp : N 00 /  
Underwater Insp: N 00 /  
Other Spec Insp: N 00 /

On and Under Record Data

Route On  
(5) Inventory Route 168000000  
(10) Min Vert Clr 99.99 M  
(11) Kilometer Point 0000.000  
(19) Detour Length 199 km  
(20) Toll 3  
(26) Func Class 09  
(28) Lanes on/under 0200  
(29) ADT 200  
(30) Year of ADT 1998  
(47) Total Horz Clearance 07.9 M  
(100) Defense Hwy 0  
(101) Parallel Str N  
(102) Direction of Traffic 2  
(104) Hwy System 0  
(109) Truck Traffic 05%  
(110) Natl Truck Network No

Proposed Improvements

(75) Type of Work  
(76) Improvement Length 000000 M  
(94) Bridge Improv Cost 0  
(95) Rdwy Improv Cost 0  
(96) Total Proj Cost 0  
(97) Year of Cost Est 0000  
(114) Future ADT 200  
(115) Year of Future ADT 2015

Condition Rating

(58) Deck 8  
(59) Superstructure 8  
(60) Substructure 7  
(61) Channel & Channel Protect 8  
(62) Culverts N

General Data

(21) Maintenance Responsibility 70  
(22) Owner 70  
(31) Design Load 4  
(33) Bridge Median 0  
(34) Skew 25 deg  
(35) Str Flared No  
(37) Hist Significance 5  
(38) Navigation Control 0  
(42) Type of Service 55  
(43) Structure Type Main 302  
(44) Structure Type Approach 000  
(45) No of Span Main 001  
(46) No of Approach Spans 0000  
(27) Year Built 1956  
(106) Year Reconstructed 0000  
(107) Deck Str Type 1  
(108) Wear Surf/Protv Sys 100  
(111) Nav Pier/Abut Protection

Appraisal Rating

(67) Structure Evaluation 5  
(68) Deck Geometry 5  
(69) Underclrn Vert & Horz N  
(71) Waterway Adequacy 7  
(72) Approach Rdwy Alignment 3  
(36) Traffic Safety Features 1011  
(113) Scour Critical Bridges 5

Load Rate and Post

(41) Str Open/Post/Close Open  
(64) Operating Rating 28.1 ton  
(66) Inventory Rating 18.1 ton  
(70) Bridge Posting 5

Over 200 Items

(200) COE MSC CENAD  
(201) COE District CENAE  
(202) Structure Number CEPNEDMA2510006  
(203) Inspection Office EPDG  
(204) Inspector JOE COLUCCI  
(205) Inspection Cost 006000  
(206) Cooper's Loading  
(207) Railroad Stru Number  
(208) Name of Railroad  
(209) Recommended Speed Limit  
(210) Posted Speed Limit (KPH)  
(211) MACOM  
(212) Installation Name  
(213) Military Wheel Load Class  
(214) Military Truck Load Class  
(215) Installation Number  
(216) Seismic Category  
(217) Acceleration Coefficient 0.00  
(218) Soil Site Coefficient 0.0

Sufficiency Rating = 068.0  
Functionally Obsolete

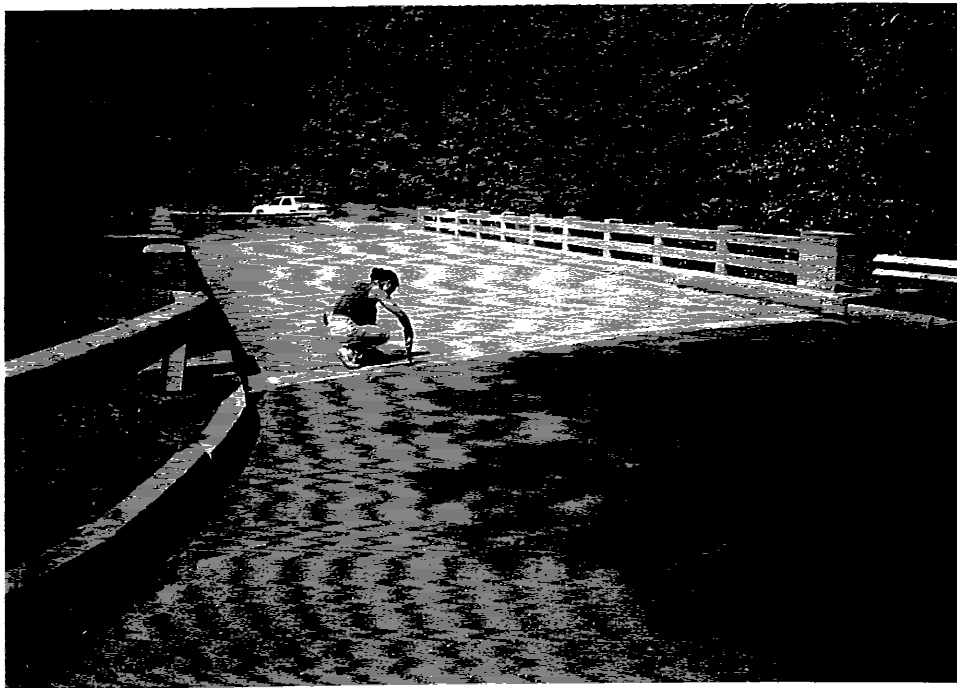


Photo 1: East approach roadway. Note the rust spots on the approach guardrail; the good condition of the expansion joint plate; and the good condition of the bridge deck.

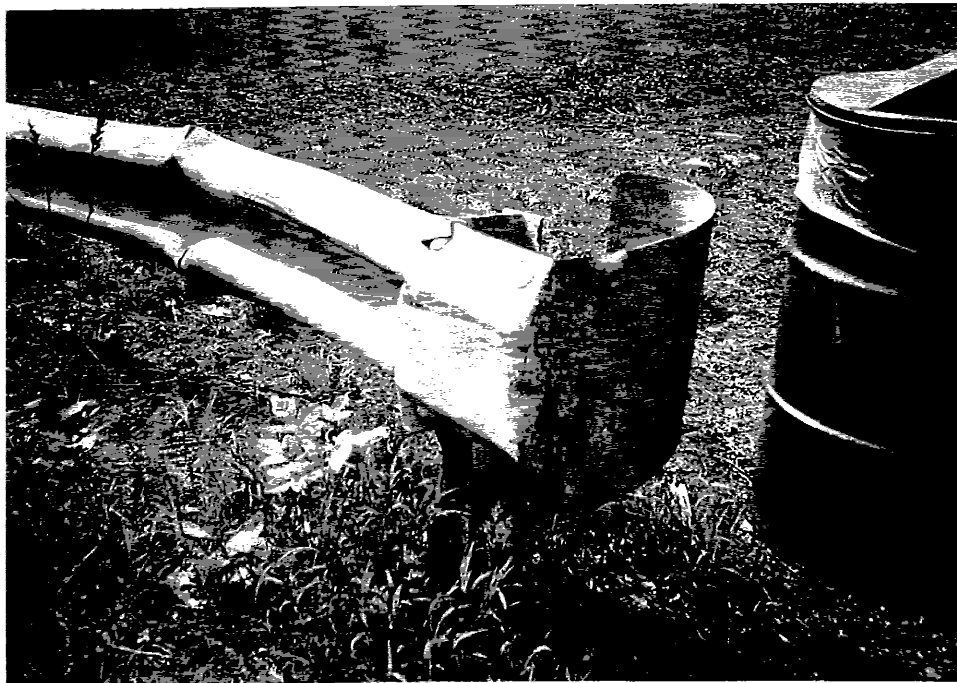


Photo 2: The damaged westernmost rail of the west approach guardrail. Note the rust stains of the rail and post.

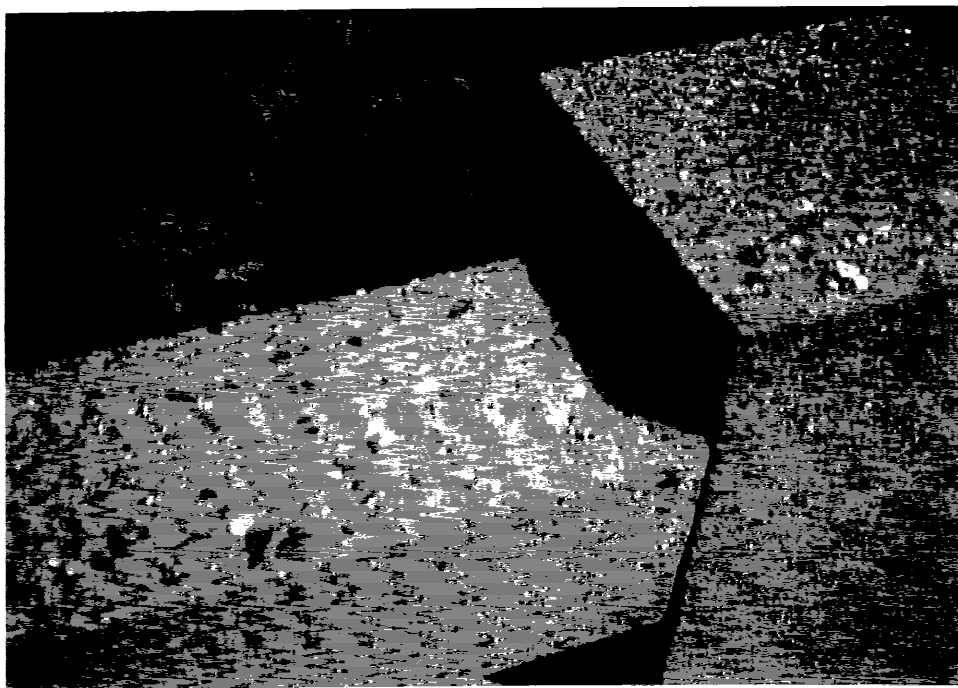


Photo 3: The top rail of the north bridge guardrail. *Note the exposed aggregate at the surface.*

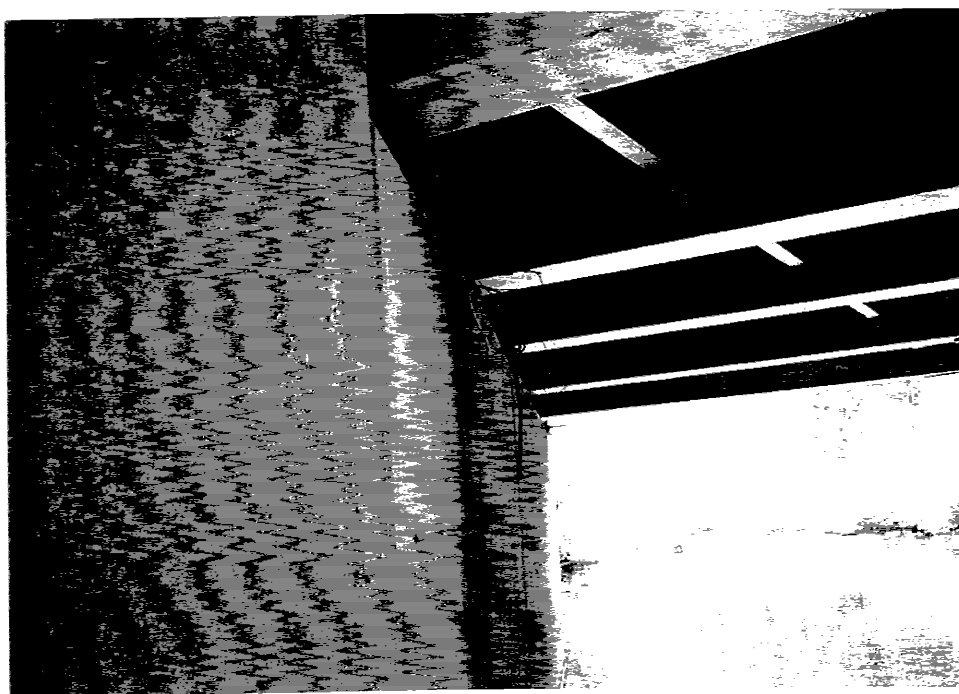


Photo 4: Debris accumulated at the east abutment bridge seat. *Note the areas of rust on the bottom flange of the beam.*

WESTVILLE LAKE  
OLD SOUTH STREET BRIDGE  
STURBRIDGE, MASSACHUSETTS  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

29 May 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection, 2 May 96  
Routine Inspection, 2 June 94  
Routine Inspection, 26 Aug 92  
Routine Inspection, 21 Aug 90  
Inventory Inspection, 27 Mar 85

BRIDGE DESCRIPTION AND HISTORY

The bridge, built in 1956, is a simple span, composite steel stringer structure. The bridge carries Old South Street over the Quinebaug River at the Westville Reservoir in Sturbridge, Massachusetts. The span length is 85'-6 1/8", and the roadway width is 26'-0", consisting of two 12'-0" travel lanes and two 1'-0" shoulders.

The superstructure consists of five wide flange rolled beams spaced at 6'-10 1/2" on center. All beams are 36WF194 sections with bottom cover plates. The interior beam cover plates are 11" x 1 1/4" x 63'-0" long. Exterior beam cover plates are 9" x 1" x 60'-0" long. The beams support an 8" thick reinforced concrete deck slab. The substructure consists of unreinforced concrete gravity abutments with flared wingwalls on spread footings.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	22T	31T	No change in rating.
3	25T	48T	
3S2	30T	60T	

EVALUATION (See attached "Structures Inspection Field Report")

A. Approach Roadway

Concrete approach slabs added in 1994 at the east and west approaches are in overall good condition. However, there is a



full length shrinkage crack at the west approach slab. The transitions between the bituminous approaches to the concrete approaches to the concrete bridge deck are all smooth. The overall condition of the steel approach guardrails is good, although both sides of each approach are slightly damaged. Guardrail bolts are missing at various locations along both approaches. Sections of bridge rail transition have been added and bolted to the approach sections to eliminate the tack welding noted in the previous inspection report. The bridge is load posted at both approaches. The alignment at the east approach is fair due to the approximately 45° angle between the bridge deck and the approach road. The alignment at the west approach is poor due to the nearly 90° angle between the bridge deck and the approach road.

#### B. Deck

The overall condition of the concrete deck and curbs is good. Minor sand debris was noted at the edges of the deck. The expansion joint plate is rusted and requires painting. Hairline cracks with efflorescence were noted at both outside faces of the curb at the guardrail post locations. The paint system has failed at the bridge deck guardrails. The paint is simply peeling off the posts and rails.

#### C. Superstructure

The overall condition of the steel superstructure and bearings is good. The bearings were not accessible to be fully inspected. The neoprene drainage trough at the bridge expansion joint was not uniformly installed. No seepage was observed and it wasn't evident whether the trough was functioning properly.

#### D. Substructure

Overall, the condition of both the east and west abutments is good. At the top of the northwest wingwall, a previously repaired concrete patch at the vertical joint is debonding from the adjacent concrete. There is a full height, diagonal crack (width of  $\frac{1}{16}$ " ) with efflorescence located approximately 5' from the end of the southwest wingwall. Runoff from the road drains behind the southwest wingwall, causing moderate erosion. There were no deficiencies noted at the east abutment.

#### E. Channel

Channel alignment is good upstream. Downstream, the channel curves moderately to the east. Although no scour problems have been noted in previous inspections, water levels during this inspection were too high to inspect abutments for scour.

### CONDITION RATING

Routine, 1998	7
Routine, 1996	8
Routine, 1994	6
Routine, 1992	6
Routine, 1990	6
Inventory, 1984	7

### RECOMMENDATIONS

#### A. Status of Previous Recommendations

Anchor tack welded guardrail sections with bolts

Completed.

#### B. Revised Recommendations

Stabilize the erosion problem behind the southwest wingwall with a paved bituminous concrete drainage trough or similar system.

Estimated Cost: \$3,000

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>STURBRIDGE, MA</b>		bridge dept. no.	8-structure no. <b>CEPNEDMA2510007</b>	90-date inspected <b>29 MAY 1998</b>
st. <b>118</b>	104-highway system <b>Ø - NOT ON NHS</b>	22-owner <b>ARMY CORPS OF ENGINEERS</b>	27-year built <b>1960</b>	106-year rebuilt <b>_____</b>
43-structure type <b>302 - STEEL STRINGER</b>			quality control engineer <b>NICK FORBES</b>	
07-facility carried <b>OLD SOUTH ST</b>			team leader <b>JOE COLUCCI</b>	
06-features intersected <b>QUINEBAUG RIVER</b>			team members <b>JENNIFER LEE ; CHIWAY HSIUNG</b>	

<b>item 58</b> <span style="float: right;"><b>8</b></span> <b>DECK</b> 1. Wearing Surface <span style="float: right;"><b>9</b></span> 2. Deck-Condition <span style="float: right;"><b>9</b></span> 3. Stay in Place Forms <span style="float: right;"><b>NA</b></span> 4. Curbs <span style="float: right;"><b>9</b></span> 5. Median <span style="float: right;"><b>NA</b></span> 6. Sidewalks <span style="float: right;"><b>NA</b></span> 7. Parapet <span style="float: right;"><b>8</b></span> 8. Railing <span style="float: right;"><b>8</b></span> 9. Anti Missile Fence <span style="float: right;"><b>NA</b></span> 10. Drains <span style="float: right;"><b>NA</b></span> 11. Lighting Standards <span style="float: right;"><b>NA</b></span> 12. Utilities <span style="float: right;"><b>NA</b></span> 13. Deck Joints <span style="float: right;"><b>7</b></span> 14. Approach Settlement <span style="float: right;"><b>8</b></span>	<b>item 59</b> <span style="float: right;"><b>8</b></span> <b>SUPERSTRUCTURE</b> 1. Bearing Devices <span style="float: right;"><b>7</b></span> 2. Stringers <span style="float: right;"><b>NA</b></span> 3. Diaphragms <span style="float: right;"><b>8</b></span> 4. Girders or Beams <span style="float: right;"><b>8</b></span> 5. Floor Beams <span style="float: right;"><b>NA</b></span> 6. Trusses <span style="float: right;"><b>NA</b></span> 7. Rivets or Bolts <span style="float: right;"><b>8</b></span> 8. Welds <span style="float: right;"><b>8</b></span> 9. Collision Damage <span style="float: right;"><b>8</b></span> 10. Load Deflection <span style="float: right;"><b>8</b></span> 11. Member Alignment <span style="float: right;"><b>8</b></span> 12. Load Vibration <span style="float: right;"><b>8</b></span> 13. Paint-Epoxy <span style="float: right;"><b>8</b></span> 14. Year Painted <span style="float: right;"><b>94</b></span> 15. Under Clearance _____ ft _____ in Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<b>item 60</b> <span style="float: right;"><b>7</b></span> <b>SUBSTRUCTURE</b> 1. Abutments a-Wings <span style="float: right;"><b>7</b></span> b-Backwall <span style="float: right;"><b>7</b></span> c-Bridge Seats <span style="float: right;"><b>7</b></span> d-Breastwall <span style="float: right;"><b>7</b></span> e-Footings <span style="float: right;"><b>NA</b></span> f-Piles <span style="float: right;"><b>NA</b></span> g-Erosion <span style="float: right;"><b>6</b></span> h-Settlement <span style="float: right;"><b>7</b></span> 2. Piers or Bents a-Caps <span style="float: right;"><b>NA</b></span> b-Column <span style="float: right;"><b>NA</b></span> c-Web <span style="float: right;"><b>NA</b></span> d-Footing <span style="float: right;"><b>NA</b></span> e-Piles <span style="float: right;"><b>NA</b></span> f-Scour <span style="float: right;"><b>NA</b></span> g-Settlement <span style="float: right;"><b>NA</b></span> 3. Collision Damage <span style="float: right;"><b>8</b></span> 4. Hydraulic-Adequacy <span style="float: right;"><b>8</b></span>
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Actual Posting <span style="float: right;">H 3 3S2</span> <div style="display: flex; justify-content: space-around;"> <span><b>22</b></span> <span><b>25</b></span> <span><b>30</b></span> </div> Recommended Posting From Rating Book <div style="display: flex; justify-content: space-around;"> <span><b>22</b></span> <span><b>25</b></span> <span><b>30</b></span> </div> SIGNS IN PLACE <span style="float: right;">at bridge</span> Y or N <span style="float: right;"><b>N</b></span>	Overhead Signs (attached to bridge) <input type="checkbox"/> yes <input checked="" type="checkbox"/> no 1. Welds <span style="float: right;"><input type="checkbox"/></span> 2. Bolts <span style="float: right;"><input type="checkbox"/></span> 3. Condition <span style="float: right;"><input type="checkbox"/></span>
LEGIBILITY <span style="float: right;"><b>NA</b></span>	Item 93b U/W Inspection Date: _____

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**X=UNKNOWN**
**NA=NOT APPLICABLE**
**IA=INACCESSIBLE**

PROJECT: WESTVILLE LAKE  
NAME: OLD SOUTH ST BRIDGE  
LOCATION: STURBRIDGE, MA

BRIDGE INSPECTION  
SCOUR CHECKLIST

- |  |            |
|--|------------|
| 1. Is the bridge currently experiencing, or does it have a history of, scour activity?       | <u>NO</u>  |
| 2. Is the streambed erodible? If so, does the structure have any vulnerable design features? | <u>NO</u>  |
| a. Piers, abutments with spread footings or short pile foundations.                          | <u>YES</u> |
| b. Superstructure with simple spans or non-redundant support systems.                        | <u>YES</u> |
| c. Inadequate waterway openings.   | <u>NO</u>  |
| d. Designs which collect ice and debris.   | <u>NO</u>  |
| e. All water must pass through or over structure.  | <u>YES</u> |
| f. Other.  | <u>—</u>   |
| 3. Are any characteristics of an aggressive stream or waterway present?                      | <u>NO</u>  |
| a. Active degradation or aggradation of streambed.   | <u>NO</u>  |
| b. Significant lateral movement or erosion of streambanks.                                   | <u>NO</u>  |
| c. Steep slopes.   | <u>NO</u>  |
| d. High velocities.  | <u>NO</u>  |
| e. Any history of highway or bridge damage during past floods.                               | <u>NO</u>  |
| f. Other.  | <u>—</u>   |
| 4. Is the bridge located on a stream reach with any adverse flow characteristics?            | <u>NO</u>  |
| a. Crossing near stream confluence.  | <u>NO</u>  |
| b. Crossing of tributary stream near confluence with larger streams.                         | <u>NO</u>  |
| c. Crossing on sharp bend in stream.   | <u>NO</u>  |
| d. Location on alluvial fan.   | <u>NO</u>  |
| e. Other.  | <u>—</u>   |
| 5. Other comments or observations.   | <u>—</u>   |

## NBI Metric Structural Inventory and Appraisal

Date Printed: 09/02/98

(202) Corps of Engineers Structure Number: CEPNEDMA2510007

(8) NBI Structure Number: CEPNEDMA2510007

## Geographic and Route Data

## Dimensional Data

## Inspection Data

(1) State Massachusetts  
 (2) District 00  
 (3) County 027  
 (4) Place 00000  
 (6) Feature Under QUINEBAUG RIVER  
 (7) Facility on OLD SOUTH STREET  
 (9) Location S.BRIDGE-STURBRIDGE LINE  
 (16) Latitude 42° 04' 00.00"  
 (17) Longitude 072° 03' 00.00"  
 (98) Border Bridge  
 (99) Border Bridge Str No  
 (103) Temporary Str

(32) Approach Rdwy Width 7.9 M  
 (39) Navigation Vert Clr 0.0 M  
 (40) Navigation Horz Clr 0.0 M  
 (48) Max Span Length 0026.1 M  
 (49) Str Length 00027.3 M  
 (50) Curb/Sidewalk Width Left 00.7 M  
 Right 00.7 M  
 (51) Brg Rdwy Width, curb-curb 007.9 M  
 (52) Deck Width out-out 009.3 M  
 (53) Min Vert Clr over 99.99 M  
 (54) Min Vert Clr under N 00.00 M  
 (55) Min Lat Underclr R N 00.0 M  
 (56) Min Lat Underclr L 99.9 M  
 (112) NBIS Bridge Length Y  
 (116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0598  
 (91) Inspection Frequency 24 Mo  
 (92) Critical Feature Insp (93) Date  
 Frac Crit Insp : N 00 /  
 Underwater Insp: N 00 /  
 Other Spec Insp: N 00 /

## On and Under Record Data

## Route On

(5) Inventory Route 168000000  
 (10) Min Vert Clr 99.99 M  
 (11) Kilometer Point 0000.000  
 (19) Detour Length 003 km  
 (20) Toll 3  
 (26) Func Class 09  
 (28) Lanes on/under 0200  
 (29) ADT 200  
 (30) Year of ADT 1998  
 (47) Total Horz Clearance 07.9 M  
 (100) Defense Hwy 0  
 (101) Parallel Str N  
 (102) Direction of Traffic 2  
 (104) Hwy System 0  
 (109) Truck Traffic 05%  
 (110) Natl Truck Network No

Proposed Improvements  
 (75) Type of Work 381  
 (76) Improvement Length 000061 M  
 (94) Bridge Improv Cost 3  
 (95) Rdwy Improv Cost 0  
 (96) Total Proj Cost 3  
 (97) Year of Cost Est 1998  
 (114) Future ADT 200  
 (115) Year of Future ADT 2015

## Condition Rating

(58) Deck 8  
 (59) Superstructure 8  
 (60) Substructure 7  
 (61) Channel & Channel Protect 7  
 (62) Culverts N

## General Data

(21) Maintenance Responsibility 70  
 (22) Owner 70  
 (31) Design Load 4  
 (33) Bridge Median 0  
 (34) Skew 00 deg  
 (35) Str Flared No  
 (37) Hist Significance 5  
 (38) Navigation Control 0  
 (42) Type of Service 55  
 (43) Structure Type Main 302  
 (44) Structure Type Approach 000  
 (45) No of Span Main 001  
 (46) No of Approach Spans 0000  
 (27) Year Built 1960  
 (106) Year Reconstructed 0000  
 (107) Deck Str Type 1  
 (108) Wear Surf/Protv Sys 100  
 (111) Nav Pier/Abut Protection

## Appraisal Rating

(67) Structure Evaluation 5  
 (68) Deck Geometry 5  
 (69) Underclrn Vert & Horz N  
 (71) Waterway Adequacy 7  
 (72) Approach Rdwy Alignment 4  
 (36) Traffic Safety Features 1111  
 (113) Scour Critical Bridges 5

## Load Rate and Post

(41) Str Open/Post/Close Open  
 (64) Operating Rating 28.1 ton  
 (66) Inventory Rating 20.0 ton  
 (70) Bridge Posting 5

## Over 200 Items

(200) COE MSC CENAD  
 (201) COE District CENAE  
 (202) Structure Number CEPNEDMA2510007  
 (203) Inspection Office EPDG  
 (204) Inspector JOE COLUCCI  
 (205) Inspection Cost 006000  
 (206) Cooper's Loading  
 (207) Railroad Stru Number  
 (208) Name of Railroad  
 (209) Recommended Speed Limit  
 (210) Posted Speed Limit (KPH)  
 (211) MACOM  
 (212) Installation Name  
 (213) Military Wheel Load Class  
 (214) Military Truck Load Class  
 (215) Installation Number  
 (216) Seismic Category  
 (217) Acceleration Coefficient 0.00  
 (218) Soil Site Coefficient 0.0

Sufficiency Rating = 081.0

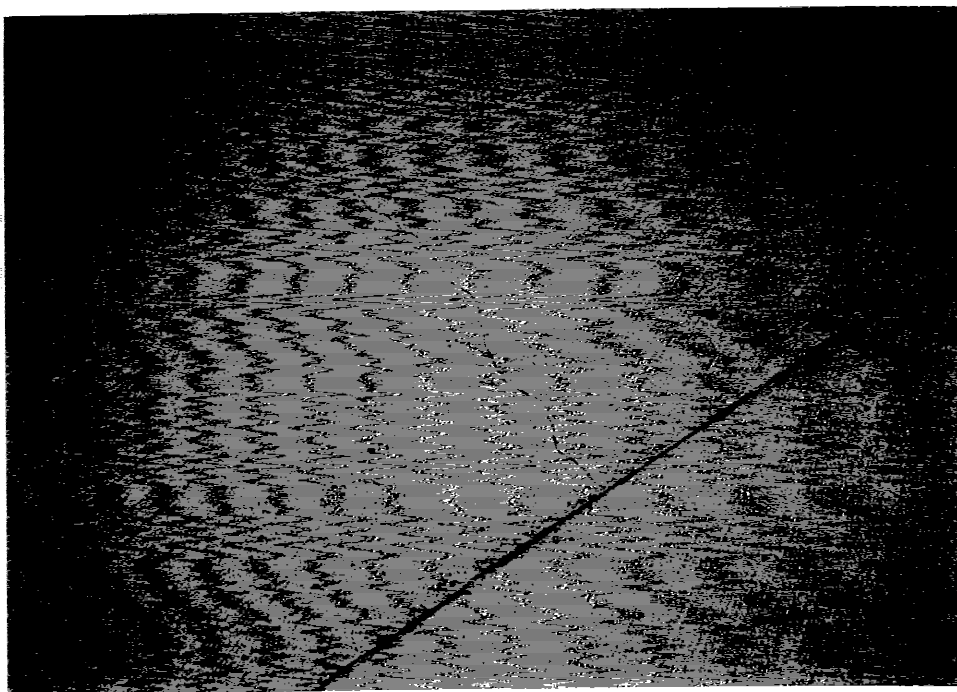


Photo 1: Full length crack at the west approach slab.



Photo 2: Missing bolts at the approach guardrail.

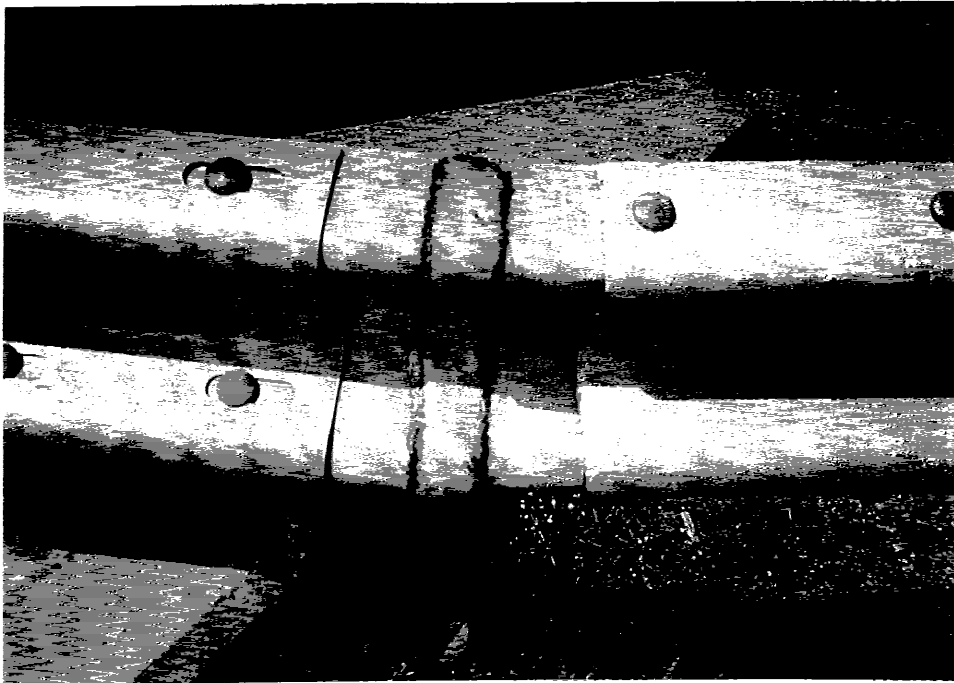


Photo 3: New section of transition guardrail installed and bolted to the approach guardrail. *Note the tack welded piece is bolted at both ends to allow for movement.*

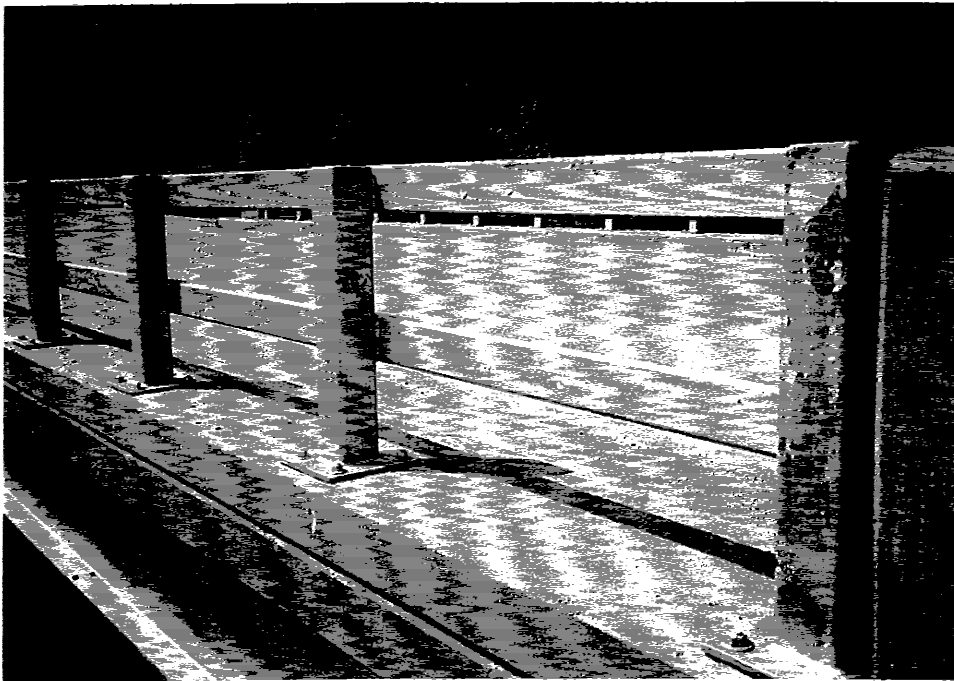


Photo 4: Hairline cracks with efflorescence on the outside face of the curb at the guardrail post locations. *Note the paint system peeling at the bridge deck guardrails.*

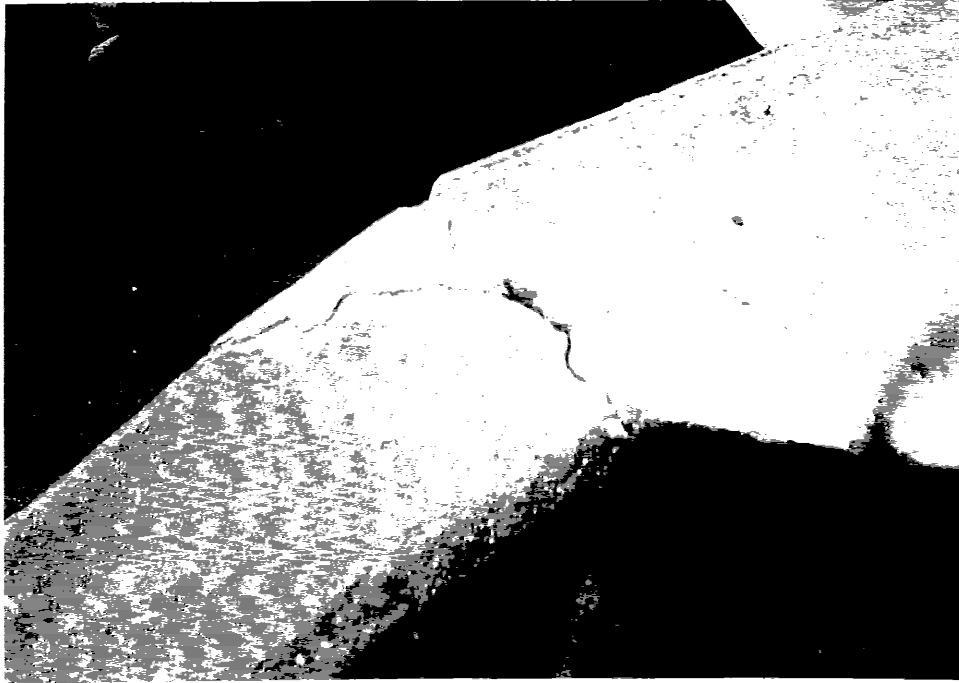


Photo 5: Concrete repair patch (sound) pulling away from the adjacent concrete at the northwest wingwall.



Photo 6: Erosion behind the southwest wingwall due to drainage from the road.



EAST BRIMFIELD LAKE  
FIVE BRIDGE ROAD BRIDGE  
BRIMFIELD, MASSACHUSETTS  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

17 June 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection,	2	May 96
Routine Inspection,	21	June 94
Routine Inspection,	16	June 92
Routine Inspection,	13	Sept 90
Routine Inspection,	13	Oct 88
Inventory Inspection,	27	June 84

BRIDGE DESCRIPTION AND HISTORY

The bridge carries Five Bridge Road over Mill Brook in the East Brimfield Lake area. It is a three span, continuous, wide flange beam structure. The beams have span lengths of 20'-4", and the total length of the bridge, end to end of deck, is 62'-11". The structure was built in 1939, and record plans of the original construction are available in the files of the Massachusetts Department of Public Works. Repairs to the structure, including a new concrete wearing surface, abutment spall and guardrail repairs, and painting of the structural steel, was completed in 1990.

The roadway width is 18'-0" between 10" high x 6" wide concrete brush blocks. There are 1'-6" wide x 11" high parapets on both sides supporting 2'-4" high steel railings. The total, out to out, dimension is 22'-0". The railings consist of 4 1/2" wide flange posts and two 3" diameter pipe rails spaced at 11" vertically. There are two cable/concrete post guardrails along both sides of the approaches which are anchored to the ends of the parapets.

Supporting the concrete deck and bituminous concrete wearing surface are six 16" deep wide flange steel beams spaced at 3'-10". There are diaphragms at the ends and at the center of each span. All of the bearings are fixed type. The abutments appear to be stub type concrete abutments with backwalls. The wingwalls are dog ear type and are parallel to the roadway. The two piers are pile bent type comprised of timber piles and concrete caps.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	15T	27T	No change in rating.
3	20T	35T	
3S2	31T	54T	

EVALUATION (See attached "Structures Inspection Field Report")

A. Approach Roadway

Both the east and west approach roadways are in very good condition. Approach alignment is very good. Bituminous paving is in good condition with minor settlement of  $1\frac{1}{2}$ " at the west transition and 1" at the east transition to the bridge deck. There are no load rating or speed limit signs. The cable and concrete post guardrail system is in overall good condition, with only a loose top cable at the northeast approach roadway noted.

B. Deck

The overall condition of the bridge deck is good with sand debris along both sides of the deck. Most of the deck drains on the north side are filled with sand. The drains on the south side are clear. The guardrails are in good condition. The nine missing anchor bolts at the south guardrail base plates noted in the previous inspection have not been replaced. There is graffiti on both the north and south curbs.

C. Superstructure

The superstructure is in overall good condition. Painted steel surfaces are in good condition.

D. Substructure

Both the east and west abutments are in good condition. At the northwest wingwall, minor delamination with efflorescence is noted. The delaminated patch at the southeast corner of the east abutment has not further deteriorated since the previous inspection. There is a minor amount of debris accumulated at the abutment bridge seats. The timber piles and concrete caps above the water line are in good condition. The underwater inspection performed on 6 April 1998 by the Massachusetts Highway Department (see attached report) indicated that timber piles below the water line are also in good condition with no deterioration found.

#### E. Channel

Channel alignment is good on the downstream south side. The upstream channel curves 90° to the east. Water levels deepen slightly at the timber piers to 5 1/2' to 7' deep. An underwater inspection of the bridge performed on 6 April 1998 indicated that scour is not a problem due to the riprap protection.

#### CONDITION RATING

Routine, 1998	8
Routine, 1996	8
Routine, 1994	8
Routine, 1992	8
Routine, 1990	5
Routine, 1988	5
Inventory, 1984	7

#### RECOMMENDATIONS

##### A. Status of Previous Recommendations

Replace nine missing anchor bolts at the south bridge guardrail.

Not completed.

##### B. Revised Recommendations

Perform previous recommendations.

Estimated Cost: \$500.00

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>BRIMFIELD, MA</b>		bridge dept. no.		8-structure no. <b>CEPNEDMA2510005</b>		90-date inspected <b>17 JUNE 1998</b>	
st.	104-highway system <b>Ø - NOT ON NHS</b>	22-owner <b>ARMY CORPS OF ENGINEERS</b>		27-year built <b>1939</b>	106-year rebuilt		11-milepoint
43-structure type <b>402 - 3 SPAN, CONTINUOUS WIDE FLANGE BEAM</b>				quality control engineer <b>NICK FORBES</b>			
07-facility carried <b>FIVE BRIDLE ROAD</b>				team leader <b>JOE COLUCCI</b>			
06-features intersected <b>MILL BROOK</b>				team members <b>JENNIFER LEE, ED HILLS</b>			

<b>item 58</b> <span style="float: right;"><b>8</b></span> <b>DECK</b> 1. Wearing Surface <span style="float: right;"><b>8</b></span> 2. Deck-Condition <span style="float: right;"><b>8</b></span> 3. Stay in Place Forms <span style="float: right;"><b>NA</b></span> 4. Curbs <span style="float: right;"><b>8</b></span> 5. Median <span style="float: right;"><b>NA</b></span> 6. Sidewalks <span style="float: right;"><b>NA</b></span> 7. Parapet <span style="float: right;"><b>8</b></span> 8. Railing <span style="float: right;"><b>6</b></span> 9. Anti Missile Fence <span style="float: right;"><b>NA</b></span> 10. Drains <span style="float: right;"><b>7</b></span> 11. Lighting Standards <span style="float: right;"><b>NA</b></span> 12. Utilities <span style="float: right;"><b>NA</b></span> 13. Deck Joints <span style="float: right;"><b>NA</b></span> 14. Approach Settlement <span style="float: right;"><b>6</b></span>	<b>item 59</b> <span style="float: right;"><b>8</b></span> <b>SUPERSTRUCTURE</b> 1. Bearing Devices <span style="float: right;"><b>8</b></span> 2. Stringers <span style="float: right;"><b>NA</b></span> 3. Diaphragms <span style="float: right;"><b>8</b></span> 4. Girders or Beams <span style="float: right;"><b>8</b></span> 5. Floor Beams <span style="float: right;"><b>NA</b></span> 6. Trusses <span style="float: right;"><b>NA</b></span> 7. Rivets or Bolts <span style="float: right;"><b>8</b></span> 8. Welds <span style="float: right;"><b>NA</b></span> 9. Collision Damage <span style="float: right;"><b>NA</b></span> 10. Load Deflection <span style="float: right;"><b>NA</b></span> 11. Member Alignment <span style="float: right;"><b>8</b></span> 12. Load Vibration <span style="float: right;"><b>NA</b></span> 13. Paint-Epoxy <span style="float: right;"><b>8</b></span> 14. Year Painted <span style="float: right;"><b>1</b></span> 15. Under Clearance _____ ft _____ in Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<b>item 60</b> <span style="float: right;"><b>7</b></span> <b>SUBSTRUCTURE</b> 1. Abutments a-Wings <span style="float: right;"><b>7</b></span> b-Backwall <span style="float: right;"><b>8</b></span> c-Bridge Seats <span style="float: right;"><b>7</b></span> d-Breastwall <span style="float: right;"><b>8</b></span> e-Footings <span style="float: right;"><b>8</b></span> f-Piles <span style="float: right;"><b>NA</b></span> g-Erosion <span style="float: right;"><b>8</b></span> h-Settlement <span style="float: right;"><b>8</b></span> 2. Piers or Bents a-Caps <span style="float: right;"><b>8</b></span> b-Column <span style="float: right;"><b>NA</b></span> c-Web <span style="float: right;"><b>NA</b></span> d-Footing <span style="float: right;"><b>NA</b></span> e-Piles <span style="float: right;"><b>7</b></span> f-Scour <span style="float: right;"><b>8</b></span> g-Settlement <span style="float: right;"><b>8</b></span> 3. Collision Damage <span style="float: right;"><b>8</b></span> 4. Hydraulic-Adequacy <span style="float: right;"><b>8</b></span>
--	---	---

Actual Posting      H    3    3S2      Single <b>N</b> <b>N</b> <b>N</b> <b>N</b> Recommended Posting From Rating Book <b>15</b> <b>20</b> <b>31</b> <b>—</b> SIGNS IN PLACE      at bridge      advance Y or N <b>N</b> <b>N</b> LEGIBILITY <b>—</b> <b>—</b>	Overhead Signs (attached to bridge) <input type="checkbox"/> yes <input checked="" type="checkbox"/> no 1. Welds <span style="float: right;"><input type="checkbox"/></span> 2. Bolts <span style="float: right;"><input type="checkbox"/></span> 3. Condition <span style="float: right;"><input type="checkbox"/></span> Item 93b    U/W Inspection Date: <b>6 APRIL 1998</b>
--	--

<b>ITEM 61-channel and channel protection</b> <span style="float: right;"><b>8</b></span> 1. channel scour <span style="float: right;"><b>8</b></span> 2. embankment erosion <span style="float: right;"><b>8</b></span> 3. fender system <span style="float: right;"><b>NA</b></span> 4. spur dikes & jetties <span style="float: right;"><b>NA</b></span> 5. rip rap or slope paving <span style="float: right;"><b>8</b></span> 6. effectiveness <span style="float: right;"><b>8</b></span> 7. debris <span style="float: right;"><b>7</b></span> 8. vegetation <span style="float: right;"><b>7</b></span>	<b>36-Traffic Safety features</b> 1. bridge railing <span style="float: right;"><b>1</b></span> 2. transitions <span style="float: right;"><b>1</b></span> 3. approach guardrail <span style="float: right;"><b>N</b></span> 4. guardrail terminal <span style="float: right;"><b>N</b></span> 36      condition <b>1</b> <b>6</b> <b>1</b> <b>6</b> <b>N</b> <b>6</b> <b>N</b> <b>—</b>
---	---

**X=UNKNOWN      NA=NOT APPLICABLE      IA=INACCESSIBLE**

PROJECT: EAST BRIMFIELD LAKE  
NAME: FIVE BRIDGE ROAD  
LOCATION: BRIMFIELD, MA

BRIDGE INSPECTION  
SCOUR CHECKLIST

1. Is the bridge currently experiencing, or does it have a history of, scour activity?

NO

2. Is the streambed erodible? If so, does the structure have any vulnerable design features?

YES

a. Piers, abutments with spread footings or short pile foundations.

YES

b. Superstructure with simple spans or non-redundant support systems.

NO

c. Inadequate waterway openings.

NO

d. Designs which collect ice and debris.

NO

e. All water must pass through or over structure.

YES

f. Other.

—

3. Are any characteristics of an aggressive stream or waterway present?

NO

a. Active degradation or aggradation of streambed.

NO

b. Significant lateral movement or erosion of streambanks.

NO

c. Steep slopes.

NO

d. High velocities.

NO

e. Any history of highway or bridge damage during past floods.

NO

f. Other.

—

4. Is the bridge located on a stream reach with any adverse flow characteristics?

NO

a. Crossing near stream confluence.

NO

b. Crossing of tributary stream near confluence with larger streams.

NO

c. Crossing on sharp bend in stream.

NO

d. Location on alluvial fan.

NO

e. Other.

—

5. Other comments or observations.

•

↳ SEE THE ATTACHED UNDERWATER INSPECTION REPORT  
FROM THE MASSACHUSETTS HIGHWAY DEPARTMENT DATED  
6 APRIL 1998.

2- district  
COE

MASSACHUSETTS HIGHWAY DEPARTMENT  
**UNDERWATER OPERATIONS TEAM**  
**DIVERS ACTIVITY REPORT**

bridge dept. no.  
B-24-17

4-city/town BRIMFIELD		5-facility carried FIVE BRIDGE RD.		6-features intersected MILL BROOK		93b-date inspected 4/6/98	
bin no. 4W4	8-structure no. COE 025 1MA 005		foundation type			dive master P. THOMPSON	
inspection level II	access to bridge EMBANKMENT			team members J. MANKOWSKI, S. FINCK			
bottom conditions RIP RAP, SILT		water conditions APPEARS CLEAN			depth 2 m	visibility 1 m	current SLIGHT

Item 60 (Underwater)

Substructure

**1. Abutments**

- a.) Wings
- b.) Breastwall
- c.) Pointing
- d.) Footings
- e.) Piles
- f.) Scour
- g.) Undermining
- h.) Settlement
- i.)
- j.)

7  
NA  
NA  
NA  
NA  
NA  
8  
NO  
8  
NA  
NA

**2. Piers or Bents**

- a.) Stem
- b.) Pointing
- c.) Column
- d.) Footing
- e.) Piles
- f.) Scour
- g.) Undermining
- h.) Settlement
- i.)

NA  
NA  
NA  
NA  
NA  
NA  
NA  
NA  
NA

**3. Pile Bents**

- a.) Concrete Piles
- b.) Timber Piles
- c.) Diagonal Bracing
- d.) Horizontal Bracing
- e.) Fasteners
- f.)

NA  
7  
NA  
NA  
NA  
NA

**4. Fender System**

- a.) Piles
- b.) Diagonal Bracing
- c.) Horizontal Bracing
- d.) Wales
- e.) Fasteners
- f.) Ladders
- g.)
- h.)

NA  
NA  
NA  
NA  
NA  
NA  
NA  
NA

Item 61 (Underwater)

**Channel and Channel Protection**

- 1. Debris
- 2. Aggradation
- 3. Utilities
- 4. Rip Rap
- 5.
- 6.

7  
8  
NA  
8  
NA  
NA

Item 113 **Scour Critical Bridges**

Scour

- a.) Footing Exposed
- b.) Undermining

N  
N

Scour Countermeasures

- a.) Sheeting
- b.) Rip Rap
- c.) Other

N  
Y  
N

Y=YES N=NO

Note: Undermining rated as YES or NO

Submitted by: *Paul Thompson* REB

X=UNKNOWN NA=NOT APPLICABLE IA=INACCESSIBLE

Page 1 of 4

COE

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8-STRUCTURE NO.	INSPECTION DATE
BRIMFIELD	4W4	B-24-17	COE 025 1MA 005	April 6, 1998

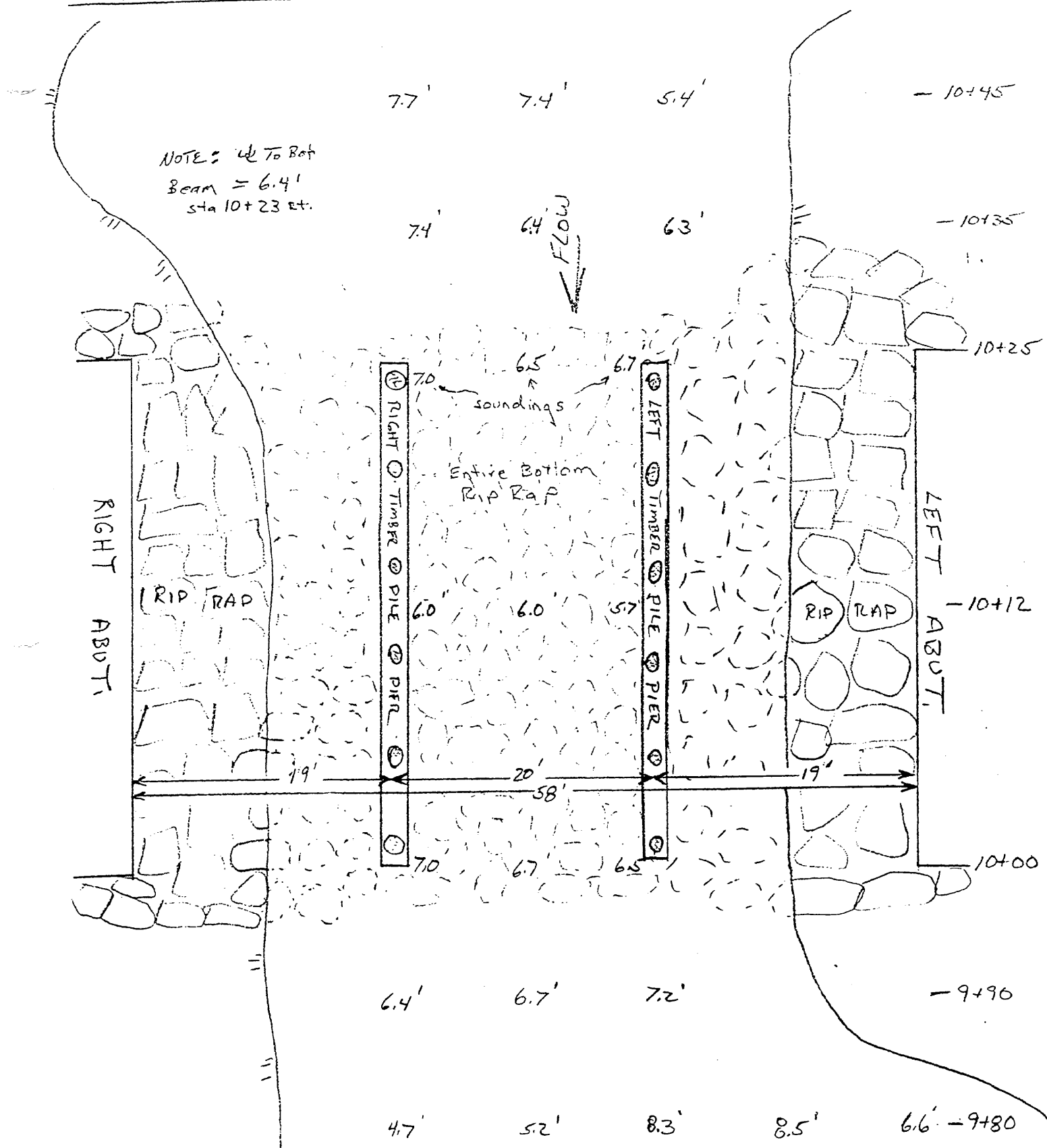
**REMARKS & PHOTOS**

Three span steel stringer bridge with timber pile bents.  
Both abutments are in the dry.  
The entire channel and slopes are protected by rip rap.  
The timber piles were probed with an ice pick and found to be in very good condition.  
The soundings were checked and found to be the same.

BRIMFIELD

B-24-17

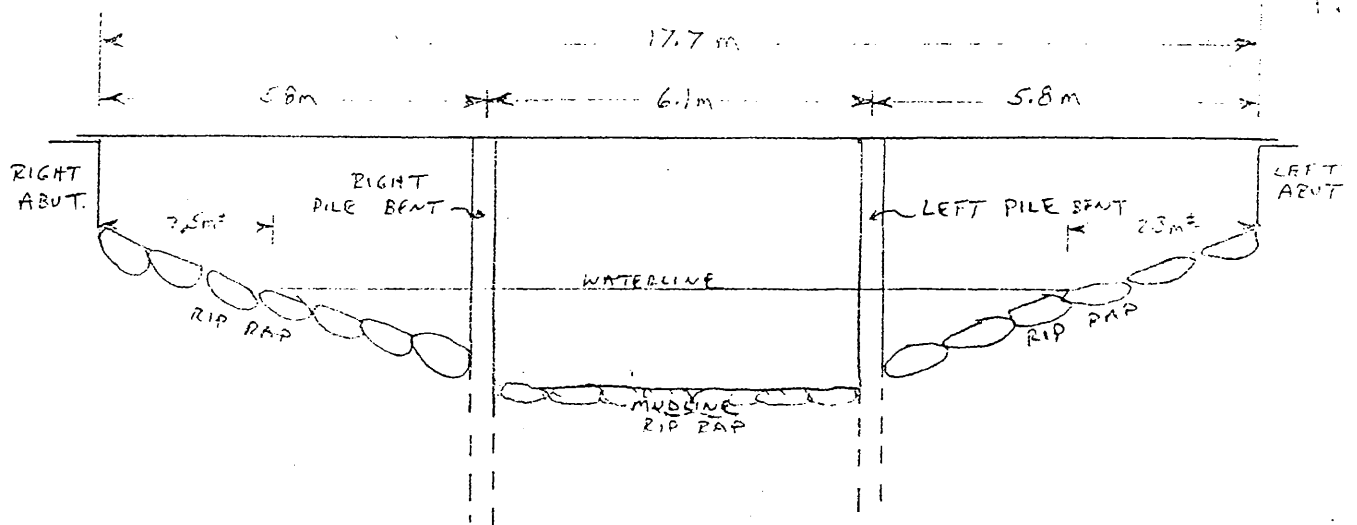
5 BRIDGE RD / MILL BROOK

P. Thompson  
4-16-92

SOUNDING PLAN (WTS)

3 of 4





SECTION STA 10+12  
(NTS)

4 of 4

Month	Day	Year
4	6	98

Town BRIMFIELD

District COE

<u>Inspectors</u>	THOMPSON	MANKOWSKI, FINCK	MHD - U/W OPNS
	<i>Leader</i>	<i>Member</i>	<i>Agency/Consultant/Dept. Name</i>

*\* It is okay to switch between Quantity and Percent for different Elements.*

NBI Metric Structural Inventory and Appraisal

Date Printed: 09/01/1998

(202) Corps of Engineers Structure Number: CEPNEDMA2510005

(8) NBI Structure Number: CEPNEDMA2510005

Geographic and Route Data

Dimensional Data

Inspection Data

(1) State Massachusetts  
(2) District 03  
(3) County 013  
(4) Place 08470  
(6) Feature Under MILL BROOK  
(7) Facility on FIVE BRIDGE ROAD  
(9) Location 9.7 KM W OF STURBRIDGE  
(16) Latitude 42° 05' 54.00"  
(17) Longitude 072° 10' 24.00"  
(98) Border Bridge  
(99) Border Bridge Str No  
(103) Temporary Str

(32) Approach Rdwy Width 5.5 M  
(39) Navigation Vert Clr 0.0 M  
(40) Navigation Horz Clr 0.0 M  
(48) Max Span Length 0006.2 M  
(49) Str Length 00019.2 M  
(50) Curb/Sidewalk Width Left 00.2 M  
Right 00.2 M  
(51) Brg Rdwy Width, curb-curb 005.5 M  
(52) Deck Width out-out 005.9 M  
(53) Min Vert Clr over 99.99 M  
(54) Min Vert Clr under N 00.00 M  
(55) Min Lat Underclr R N 00.0 M  
(56) Min Lat Underclr L 99.9 M  
(112) NBIS Bridge Length Y  
(116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0698  
(91) Inspection Frequency 24 Mo  
(92) Critical Feature Insp (93) Date  
Frac Crit Insp : N /  
Underwater Insp: Y 60 04/98  
Other Spec Insp: N /

On and Under Record Data

Route On  
(5) Inventory Route 168000000  
(10) Min Vert Clr 99.99 M  
(11) Kilometer Point 0000.000  
(19) Detour Length 006 km  
(20) Toll 3  
(26) Func Class 09  
(28) Lanes on/under 0200  
(29) ADT 300  
(30) Year of ADT 1998  
(47) Total Horz Clearance 05.5 M  
(100) Defense Hwy 0  
(101) Parallel Str N  
(102) Direction of Traffic 2  
(104) Hwy System 0  
(109) Truck Traffic 05%  
(110) Natl Truck Network No

Proposed Improvements  
(75) Type of Work 000  
(76) Improvement Length 000000 M  
(94) Bridge Improv Cost 1  
(95) Rdwy Improv Cost 0  
(96) Total Proj Cost 1  
(97) Year of Cost Est 1998  
(114) Future ADT 300  
(115) Year of Future ADT 2015

Condition Rating  
(58) Deck 8  
(59) Superstructure 8  
(60) Substructure 7  
(61) Channel & Channel Protect 8  
(62) Culverts N

Over 200 Items

(200) COE MSC CENAD  
(201) COE District CENAE  
(202) Structure Number CEPNEDMA2510005  
(203) Inspection Office EPDG  
(204) Inspector JOE COLUCCI  
(205) Inspection Cost 005000  
(206) Cooper's Loading  
(207) Railroad Stru Number  
(208) Name of Railroad  
(209) Recommended Speed Limit  
(210) Posted Speed Limit (KPH)  
(211) MACOM  
(212) Installation Name  
(213) Military Wheel Load Class  
(214) Military Truck Load Class  
(215) Installation Number  
(216) Seismic Category  
(217) Acceleration Coefficient 0.00  
(218) Soil Site Coefficient 0.0

General Data

(21) Maintenance Responsibility 70  
(22) Owner 70  
(31) Design Load 2  
(33) Bridge Median 0  
(34) Skew 00 deg  
(35) Str Flared No  
(37) Hist Significance 5  
(38) Navigation Control 0  
(42) Type of Service 55  
(43) Structure Type Main 402  
(44) Structure Type Approach 000  
(45) No of Span Main 003  
(46) No of Approach Spans 0000  
(27) Year Built 1939  
(106) Year Reconstructed 1990  
(107) Deck Str Type 1  
(108) Wear Surf/Protv Sys 600  
(111) Nav Pier/Abut Protection

Appraisal Rating  
(67) Structure Evaluation 4  
(68) Deck Geometry 3  
(69) Underclrn Vert & Horz N  
(71) Waterway Adequacy 6  
(72) Approach Rdwy Alignment 8  
(36) Traffic Safety Features 11NN  
(113) Scour Critical Bridges 5

Load Rate and Post

(41) Str Open/Post/Close Open  
(64) Operating Rating 24.5 ton  
(66) Inventory Rating 13.6 ton  
(70) Bridge Posting 5

Sufficiency Rating = 052.3  
Functionally Obsolete

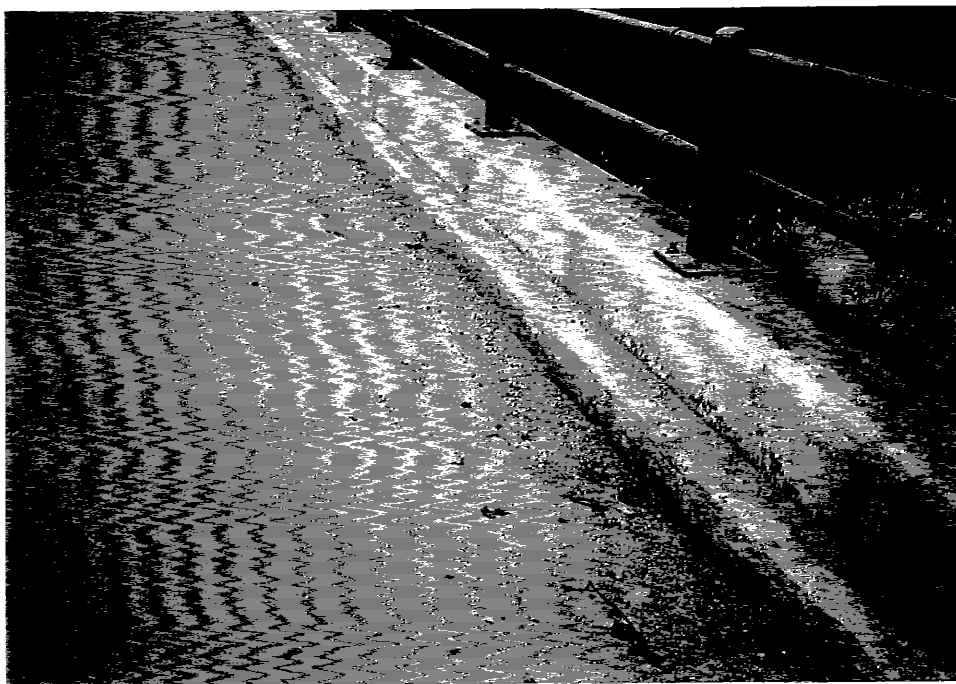


Photo 1: Sand debris along the edge of the deck.

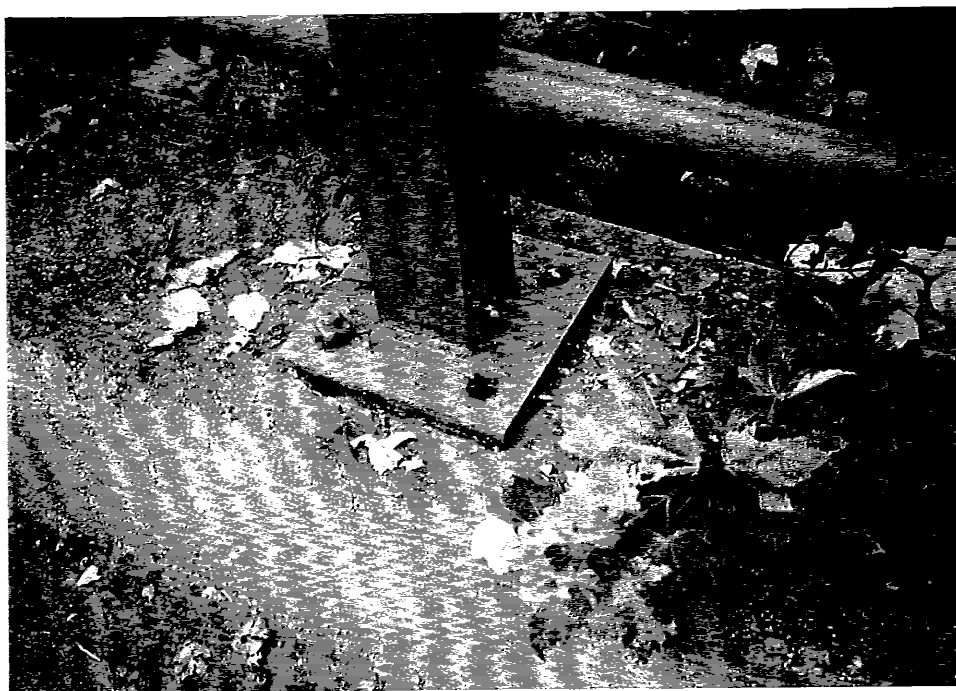


Photo 2: Missing anchor bolts at the south guardrail base plate.

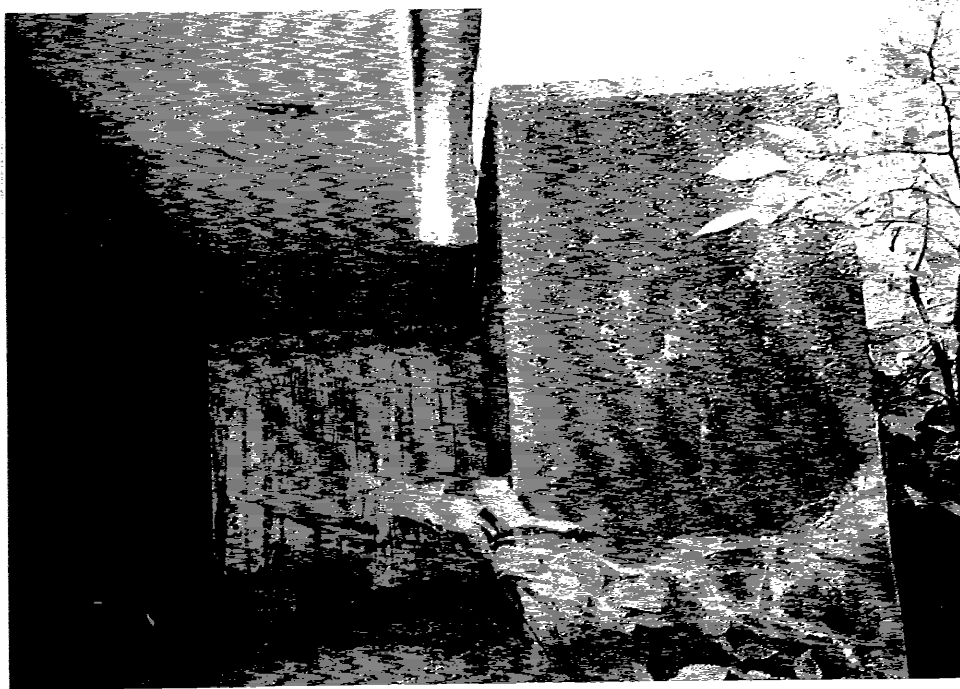


Photo 3: Minor delamination with efflorescence at the northwest wingwall. Note the vegetative growth and minor debris at the bridge seat.

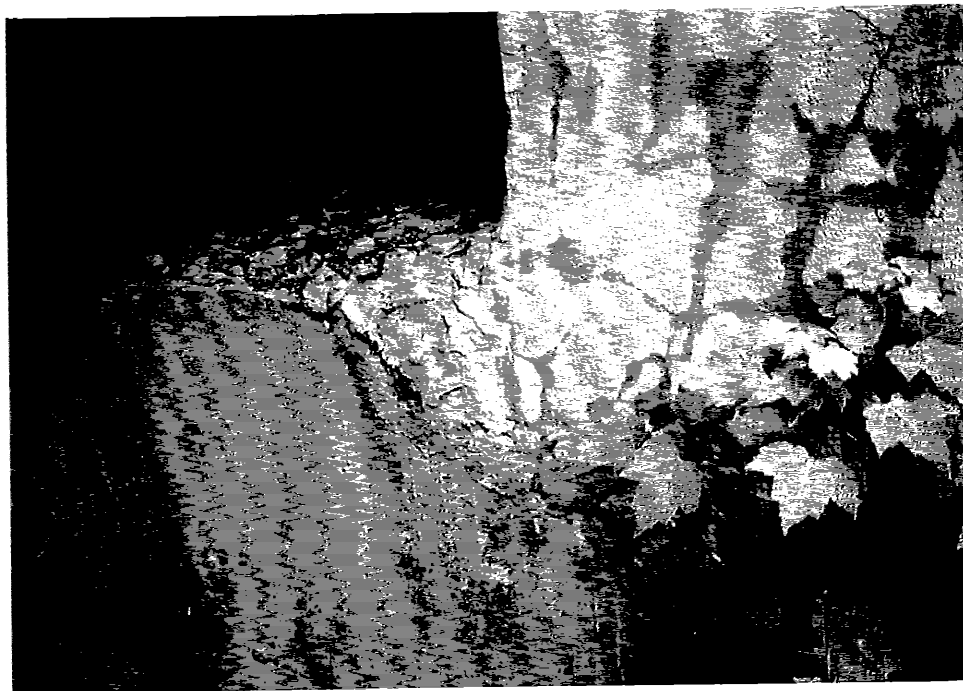


Photo 4: Delaminated patch at the southeast corner of the east abutment.

EAST BRIMFIELD LAKE  
POND BRIDGE  
HOLLAND, MASSACHUSETTS  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

17 June 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection, 2 May 96  
Routine Inspection, 21 June 94  
Routine Inspection, 16 June 92  
Routine Inspection, 13 Sept 90  
Routine Inspection, 12 Oct 88  
Inventory Inspection, 26 Mar 84

BRIDGE DESCRIPTION AND HISTORY

The bridge, built in 1934, is a simple span, non-composite, rolled beam structure. The bridge carries Pond Road over Holland Pond Outlet at East Brimfield Lake. The bridge provides a clear roadway width of 20'-0". It has a 3'-6" sidewalk on the north side. The overall width of the bridge is 25'-10".

The superstructure consists of six rolled beams spaced at 4'-10" on center. All beams are 27CB106 sections with a span of 43'-6". The stringers support a 7" reinforced concrete deck slab which was overlaid in 1992 with a 3" bonded concrete overlay (replacing an original bituminous concrete wearing surface). There are timber bridge rails with steel posts on both sides of the bridge. The substructure consists of concrete gravity type abutments.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	17T	29T	No change in rating.
3	20T	35T	
3S2	32T	55T	

EVALUATION (See attached "Structures Inspection Field Report")

A. Approach Roadway

Both the east and west approach roadways are in good condition. Bituminous paving transitions to the concrete bridge deck.

Approach alignment is good in both directions. Load limit signs are posted at both ends. There is minor vegetation growth at both joints between the approach roadways and the bridge deck. Settlement at the east and west approach roadways is  $1\frac{1}{2}$ ". Settlement at the sidewalk transition at the west end is  $1\frac{1}{2}$ ". The orientation of the north guardrail at the east approach is poor, and the end rail section has been damaged.

#### B. Deck

The overall condition of the concrete deck is very good with minor debris and vegetation along both sides of the deck. The small area of discoloration at the north parapet has not worsened. There is minor areas of honeycomb present at the south parapet. There is a spall, measuring 2' long x 6" wide x 3" deep, at the deckside face of the sidewalk curb. The corrosion of the steel edge is staining the concrete below the sidewalk curb. Delaminated areas, measuring 10' long x 9" wide, is evident at the top surface of the curb near the spall. The timber and steel post guardrail system is in good condition, however, there are many loose anchor bolt nuts at the base plates. On the underside of the deck between girders 5 and 6, there are two areas of concrete delamination, measuring 2 sf and 3 sf, located approximately 7' and  $1\frac{1}{2}$ ' respectively from the east abutment.

#### C. Superstructure

The overall condition of the steel superstructure and bearings is good. There is a bent anchor bolt at the northeast girder bearing.

#### D. Substructure

Overall, the condition of both the east and west abutments is fair to good. At the southeast wingwall, there is a 2' x 1'-6" area of delamination at the top edge, located 10' from the end. There is a minor vertical crack along the breastwall at the weephole between girders 1 and 2 (numbered south to north) at the east abutment. The northeast wingwall has a 2 sf x 2" deep spall, and a 3 sf area of unsound concrete around this spall. A 3' long, 15" wide section of the northwest wingwall is deteriorated down to the channel bottom (approximately 4' deep). Seven sections of rebar are exposed at the spalled area. From this deterioration, there is a 10' long x 15" wide area of unsound concrete at the top of this wingwall. A minor amount of graffiti is found on girder 4 at the west abutment. The full length,  $\frac{1}{8}$ " wide horizontal crack between girders 2 and 3 at the west bridge seat has not changed since the last inspection. There is minor efflorescence at the backwall between girders 1

and 2 at the west abutment.

#### E. Channel

Channel alignment is good on both the north and south sides. There are no obstructions to flow and the bridge opening is adequate. A scour inspection was performed with a boat, and scour is not a problem at this bridge.

#### CONDITION RATING

Routine, 1998	6
Routine, 1996	7
Routine, 1994	7
Routine, 1992	7
Routine, 1990	5
Routine, 1988	5
Inventory, 1984	5

#### RECOMMENDATIONS

##### A. Status of Previous Recommendations

Remove and rebuild the deteriorated concrete curb along the north side of the bridge deck.

Not completed

Repair spalled concrete along northwest and northeast wingwalls.

Not completed

##### B. Revised Recommendations

Perform previous recommendations.

Repair all areas of delaminated and deteriorated concrete.

Repair all cracks on the east and west abutment.

Estimated Total Cost: \$20,000



# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>HOLLAND, MA</b>		bridge dept. no.		8-structure no. <b>CERNEDMA 2510004</b>		90-date inspected <b>17 JUNE 1998</b>	
st.	104-highway system <b>Ø - NOT ON NHS</b>	22-owner <b>ARMY CORPS OF ENGINEERS</b>	27-year built <b>1934</b>	106-year rebuilt		11-milepoint	
43-structure type <b>362 - SINGLE SPAN, NON-COMPOSITE STEEL ROLLED BEAM</b>				quality control engineer <b>NICK FORBES</b>			
07-facility carried <b>POND ROAD</b>				team leader <b>JOE COLUCCI</b>			
06-features intersected <b>HOLLAND POND OUTLET</b>				team members <b>JENNIFER LEE &amp; ED HILLS</b>			

<p>item 58 <span style="float: right;"><b>7</b></span></p> <p>DECK</p> <ol style="list-style-type: none"> <li>1. Wearing Surface <span style="float: right;"><b>8</b></span></li> <li>2. Deck-Condition <span style="float: right;"><b>8</b></span></li> <li>3. Stay in Place Forms <span style="float: right;"><b>NA</b></span></li> <li>4. Curbs <span style="float: right;"><b>5</b></span></li> <li>5. Median <span style="float: right;"><b>NA</b></span></li> <li>6. Sidewalks <span style="float: right;"><b>8</b></span></li> <li>7. Parapet <span style="float: right;"><b>8</b></span></li> <li>8. Railing <span style="float: right;"><b>8</b></span></li> <li>9. Anti Missile Fence <span style="float: right;"><b>NA</b></span></li> <li>10. Drains <span style="float: right;"><b>NA</b></span></li> <li>11. Lighting Standards <span style="float: right;"><b>NA</b></span></li> <li>12. Utilities <span style="float: right;"><b>NA</b></span></li> <li>13. Deck Joints <span style="float: right;"><b>NA</b></span></li> <li>14. Approach Settlement <span style="float: right;"><b>7</b></span></li> </ol>	<p>item 59 <span style="float: right;"><b>8</b></span></p> <p>SUPERSTRUCTURE</p> <ol style="list-style-type: none"> <li>1. Bearing Devices <span style="float: right;"><b>8</b></span></li> <li>2. Stringers <span style="float: right;"><b>NA</b></span></li> <li>3. Diaphragms <span style="float: right;"><b>8</b></span></li> <li>4. Girders or Beams <span style="float: right;"><b>8</b></span></li> <li>5. Floor Beams <span style="float: right;"><b>NA</b></span></li> <li>6. Trusses <span style="float: right;"><b>NA</b></span></li> <li>7. Rivets or Bolts <span style="float: right;"><b>8</b></span></li> <li>8. Welds <span style="float: right;"><b>8</b></span></li> <li>9. Collision Damage <span style="float: right;"><b>8</b></span></li> <li>10. Load Deflection <span style="float: right;"><b>8</b></span></li> <li>11. Member Alignment <span style="float: right;"><b>8</b></span></li> <li>12. Load Vibration <span style="float: right;"><b>8</b></span></li> <li>13. Paint-Epoxy <span style="float: right;"><b>8</b></span></li> <li>14. Year Painted <span style="float: right;"><b>—</b></span></li> <li>15. Under Clearance <span style="float: right;"><b>—</b> ft <b>—</b> in</span></li> </ol> <p>Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no</p>	<p>item 60 <span style="float: right;"><b>6</b></span></p> <p>SUBSTRUCTURE</p> <ol style="list-style-type: none"> <li>1. Abutments               <ol style="list-style-type: none"> <li>a-Wings <span style="float: right;"><b>5</b></span></li> <li>b-Backwall <span style="float: right;"><b>7</b></span></li> <li>c-Bridge Seats <span style="float: right;"><b>7</b></span></li> <li>d-Breastwall <span style="float: right;"><b>7</b></span></li> <li>e-Footings <span style="float: right;"><b>NA</b></span></li> <li>f-Piles <span style="float: right;"><b>NA</b></span></li> <li>g-Erosion <span style="float: right;"><b>8</b></span></li> <li>h-Settlement <span style="float: right;"><b>8</b></span></li> </ol> </li> <li>2. Piers or Bents               <ol style="list-style-type: none"> <li>a-Caps <span style="float: right;"><b>NA</b></span></li> <li>b-Column <span style="float: right;"><b>NA</b></span></li> <li>c-Web <span style="float: right;"><b>NA</b></span></li> <li>d-Footing <span style="float: right;"><b>NA</b></span></li> <li>e-Piles <span style="float: right;"><b>NA</b></span></li> <li>f-Scour <span style="float: right;"><b>NA</b></span></li> <li>g-Settlement <span style="float: right;"><b>NA</b></span></li> </ol> </li> <li>3. Collision Damage <span style="float: right;"><b>8</b></span></li> <li>4. Hydraulic-Adequacy <span style="float: right;"><b>8</b></span></li> </ol>
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<p>Actual Posting <span style="float: right;">H 3 3S2</span></p> <p style="text-align: center;"><b>4</b> <b>4</b> <b>4</b></p> <p>Recommended Posting From Rating Book <span style="float: right;">17 20 32</span></p> <p style="text-align: center;"><b>17</b> <b>20</b> <b>32</b></p> <p>SIGNS IN PLACE at bridge advance</p> <p>Y or N <span style="float: right;"><b>N</b></span> <span style="float: right;"><b>Y</b></span></p> <p>LEGIBILITY <span style="float: right;"><b>—</b></span> <span style="float: right;"><b>8</b></span></p>	<p>Overhead Signs (attached to bridge)</p> <p><input type="checkbox"/> yes <input checked="" type="checkbox"/> no</p> <ol style="list-style-type: none"> <li>1. Welds <span style="float: right;"><input type="checkbox"/></span></li> <li>2. Bolts <span style="float: right;"><input type="checkbox"/></span></li> <li>3. Condition <span style="float: right;"><input type="checkbox"/></span></li> </ol> <p>Item 93b U/W Inspection Date: <span style="float: right;"><b>—</b></span></p>
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<p>ITEM 61-channel and channel protection <span style="float: right;"><b>8</b></span></p> <ol style="list-style-type: none"> <li>1. channel scour <span style="float: right;"><b>8</b></span></li> <li>2. embankment erosion <span style="float: right;"><b>8</b></span></li> <li>3. fender system <span style="float: right;"><b>NA</b></span></li> <li>4. spur dikes &amp; jetties <span style="float: right;"><b>NA</b></span></li> <li>5. rip rap or slope paving <span style="float: right;"><b>NA</b></span></li> <li>6. effectiveness <span style="float: right;"><b>8</b></span></li> <li>7. debris <span style="float: right;"><b>8</b></span></li> <li>8. vegetation <span style="float: right;"><b>8</b></span></li> </ol>	<p>36-Traffic Safety features</p> <table style="width: 100%;"> <tr> <td></td> <td style="text-align: center;">36</td> <td style="text-align: center;">condition</td> </tr> <tr> <td>1. bridge railing</td> <td style="text-align: center;"><b>1</b></td> <td style="text-align: center;"><b>8</b></td> </tr> <tr> <td>2. transitions</td> <td style="text-align: center;"><b>1</b></td> <td style="text-align: center;"><b>8</b></td> </tr> <tr> <td>3. approach guardrail</td> <td style="text-align: center;"><b>1</b></td> <td style="text-align: center;"><b>8</b></td> </tr> <tr> <td>4. guardrail terminal</td> <td style="text-align: center;"><b>1</b></td> <td style="text-align: center;"><b>7</b></td> </tr> </table>		36	condition	1. bridge railing	<b>1</b>	<b>8</b>	2. transitions	<b>1</b>	<b>8</b>	3. approach guardrail	<b>1</b>	<b>8</b>	4. guardrail terminal	<b>1</b>	<b>7</b>
	36	condition														
1. bridge railing	<b>1</b>	<b>8</b>														
2. transitions	<b>1</b>	<b>8</b>														
3. approach guardrail	<b>1</b>	<b>8</b>														
4. guardrail terminal	<b>1</b>	<b>7</b>														

**X=UNKNOWN**

**NA=NOT APPLICABLE**

**IA=INACCESSIBLE**

PROJECT: EAST BRIMFIELD LAKE  
NAME: POND RD BRIDGE  
LOCATION: HOLLAND, MA

BRIDGE INSPECTION  
SCOUR CHECKLIST

- |  |                         |
|--|-------------------------|
| 1. Is the bridge currently experiencing, or does it have a history of, scour activity?       | <u>NO</u>               |
| 2. Is the streambed erodible? If so, does the structure have any vulnerable design features? | <u>YES</u>              |
| a. Piers, abutments with spread footings or short pile foundations.                          | <u>NO</u>               |
| b. Superstructure with simple spans or non-redundant support systems.                        | <u>YES</u><br><u>NO</u> |
| c. Inadequate waterway openings.   | <u>NO</u>               |
| d. Designs which collect ice and debris.   | <u>YES</u>              |
| e. All water must pass through or over structure.  | <u>YES</u>              |
| f. Other.  | <u>      </u>           |
| 3. Are any characteristics of an aggressive stream or waterway present?                      | <u>NO</u>               |
| a. Active degradation or aggradation of streambed.   | <u>NO</u>               |
| b. Significant lateral movement or erosion of streambanks.                                   | <u>NO</u>               |
| c. Steep slopes.   | <u>NO</u>               |
| d. High velocities.  | <u>NO</u>               |
| e. Any history of highway or bridge damage during past floods.                               | <u>NO</u>               |
| f. Other.  | <u>      </u>           |
| 4. Is the bridge located on a stream reach with any adverse flow characteristics?            | <u>NO</u>               |
| a. Crossing near stream confluence.  | <u>NO</u>               |
| b. Crossing of tributary stream near confluence with larger streams.                         | <u>NO</u>               |
| c. Crossing on sharp bend in stream.   | <u>NO</u>               |
| d. Location on alluvial fan.   | <u>NO</u>               |
| e. Other.  | <u>      </u>           |
| 5. Other comments or observations.   | <u>NO</u>               |

## NBI Metric Structural Inventory and Appraisal

Date Printed: 09/01/1998

(202) Corps of Engineers Structure Number: CEPNEDMA2510004

(8) NBI Structure Number: CEPNEDMA2510004

## Geographic and Route Data

## Dimensional Data

## Inspection Data

(1) State	Massachusetts	(32) Approach Rdwy Width	6.1 M	(90) Inspection Date (MoYr)	0698
(2) District	03	(39) Navigation Vert Clr	0.0 M	(91) Inspection Frequency	24 Mo
(3) County	013	(40) Navigation Horz Clr	0.0 M	(92) Critical Feature Insp	(93) Date
(4) Place	30665	(48) Max Span Length	0013.3 M	Frac Crit Insp : N	00 /
(6) Feature Under	HOLLAND POND OUTLET	(49) Str Length	00013.7 M	Underwater Insp: N	00 /
(7) Facility on	POND ROAD	(50) Curb/Sidewalk Width	Left 00.7 M	Other Spec Insp: N	00 /
(9) Location	9.7 KM W OF STURBRIDGE		Right 01.1 M		
(16) Latitude	42° 04' 54.00"	(51) Brg Rdwy Width, curb-curb	006.1 M		
(17) Longitude	072° 09' 18.00"	(52) Deck Width out-out	007.9 M		
(98) Border Bridge		(53) Min Vert Clr over	99.99 M		
(99) Border Bridge Str No		(54) Min Vert Clr under	N 00.00 M		
(103) Temporary Str		(55) Min Lat Underclr R	N 00.0 M		
		(56) Min Lat Underclr L	99.9 M		

## On and Under Record Data

(112) NBIS Bridge Length	Y
(116) Navigation Min Vert Clr	0.0 M

	Route On
(5) Inventory Route	168000000
(10) Min Vert Clr	99.99 M
(11) Kilometer Point	0000.000
(19) Detour Length	003 km
(20) Toll	3
(26) Func Class	09
(28) Lanes on/under	0200
(29) ADT	60
(30) Year of ADT	1998
(47) Total Horz Clearance	06.1 M
(100) Defense Hwy	0
(101) Parallel Str	N
(102) Direction of Traffic	2
(104) Hwy System	0
(109) Truck Traffic	05%
(110) Natl Truck Network	No

## Proposed Improvements

(75) Type of Work	351
(76) Improvement Length	000133 M
(94) Bridge Improv Cost	20
(95) Rdwy Improv Cost	0
(96) Total Proj Cost	20
(97) Year of Cost Est	1998
(114) Future ADT	60
(115) Year of Future ADT	2015

## Condition Rating

(58) Deck	7
(59) Superstructure	8
(60) Substructure	6
(61) Channel & Channel Protect	8
(62) Culverts	N

## General Data

(21) Maintenance Responsibility	70
(22) Owner	70
(31) Design Load	2
(33) Bridge Median	0
(34) Skew	00 deg
(35) Str Flared	No
(37) Hist Significance	5
(38) Navigation Control	0
(42) Type of Service	55
(43) Structure Type Main	302
(44) Structure Type Approach	000
(45) No of Span Main	001
(46) No of Approach Spans	0000
(27) Year Built	1934
(106) Year Reconstructed	0000
(107) Deck Str Type	1
(108) Wear Surf/Protv Sys	600
(111) Nav Pier/Abut Protection	

## Appraisal Rating

(67) Structure Evaluation	4
(68) Deck Geometry	5
(69) Underclrn Vert & Horz	N
(71) Waterway Adequacy	6
(72) Approach Rdwy Alignment	6
(36) Traffic Safety Features	1111
(113) Scour Critical Bridges	5

## Load Rate and Post

(41) Str Open/Post/Close	Open
(64) Operating Rating	26.3 ton
(66) Inventory Rating	15.4 ton
(70) Bridge Posting	5

## Over 200 Items

(200) COE MSC	CENAD
(201) COE District	CENAE
(202) Structure Number	CEPNEDMA2510004
(203) Inspection Office	EPDG
(204) Inspector	JOE COLUCCI
(205) Inspection Cost	005000
(206) Cooper's Loading	
(207) Railroad Stru Number	
(208) Name of Railroad	
(209) Recommended Speed Limit	
(210) Posted Speed Limit (KPH)	
(211) MACOM	
(212) Installation Name	
(213) Military Wheel Load Class	
(214) Military Truck Load Class	
(215) Installation Number	
(216) Seismic Category	
(217) Acceleration Coefficient	0.00
(218) Soil Site Coefficient	0.0

Sufficiency Rating = 074.2

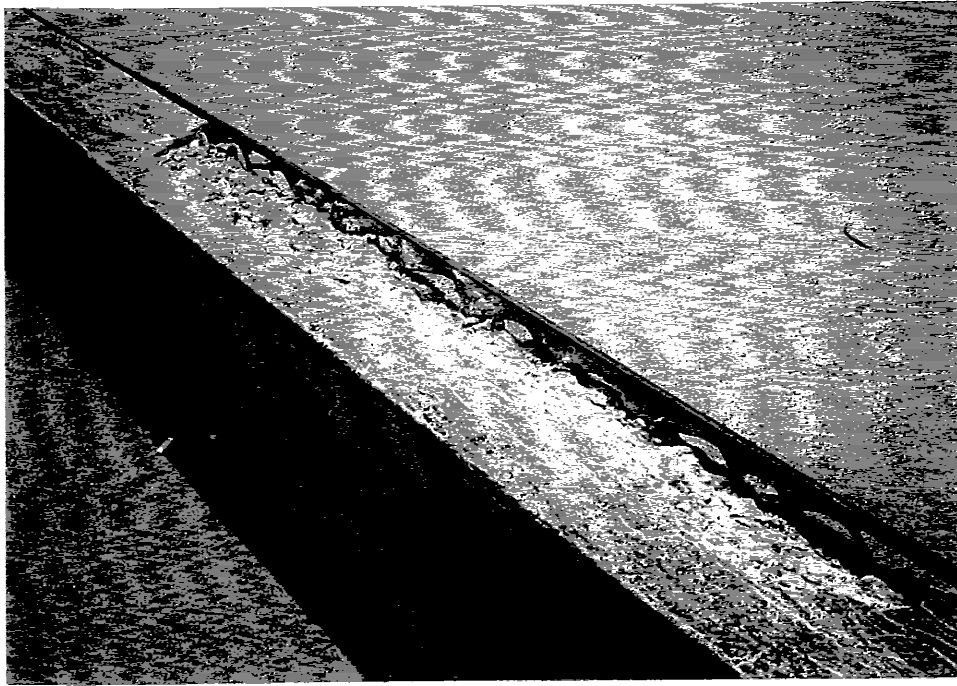


Photo 1: Deterioration (2' x 6" x 3" deep) and delamination (10' x 9") of the north sidewalk curb. *Note the corrosion of the steel curb edge.*

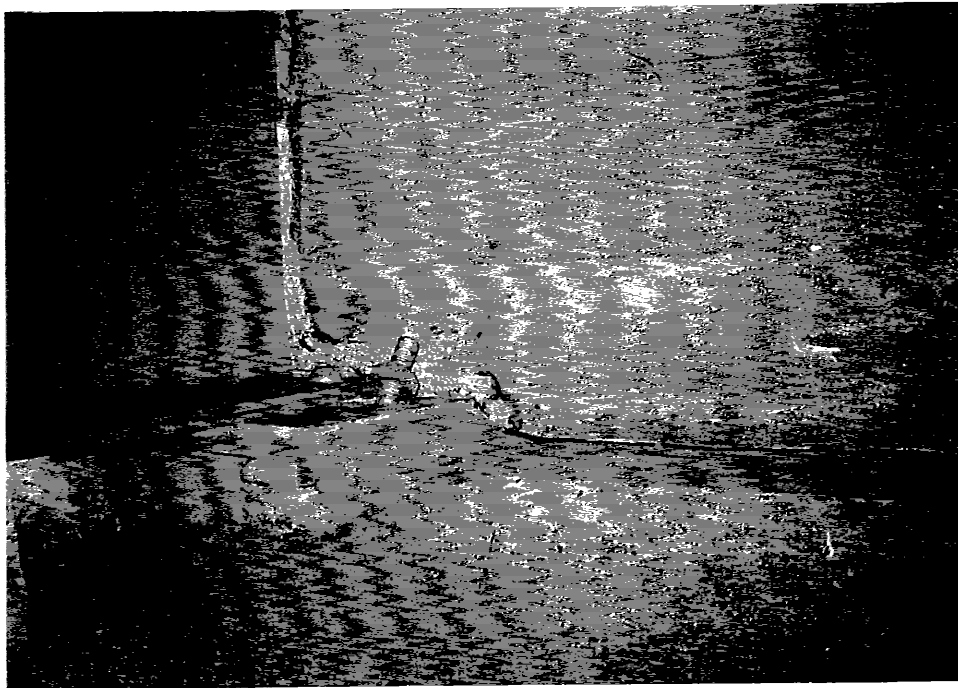


Photo 2: Bent anchor bolt at the northeast girder bearing.

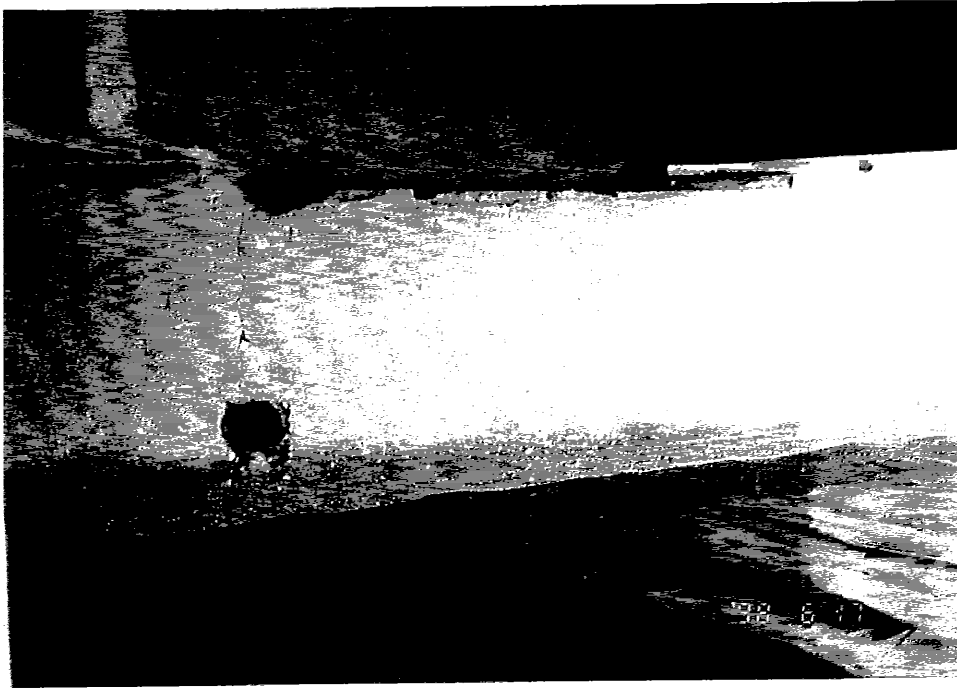


Photo 3: A minor vertical crack along the breastwall at the weephole between girders 1 and 2 at the east abutment.

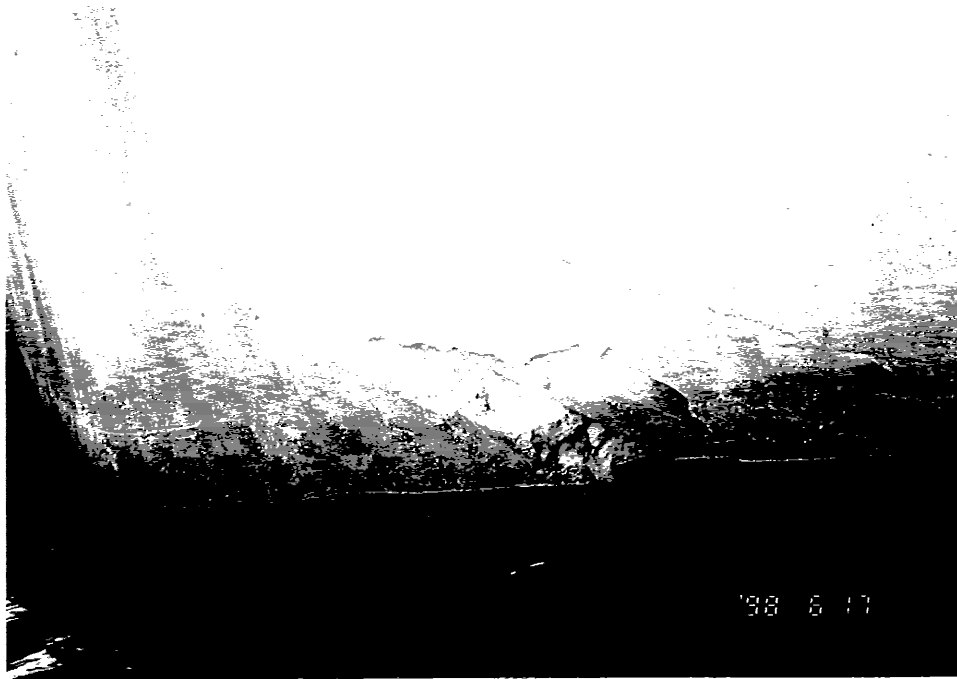


Photo 4: A 2 sf x 2" deep spall and a 3 sf of unsound concrete around this spall at the northeast wingwall.

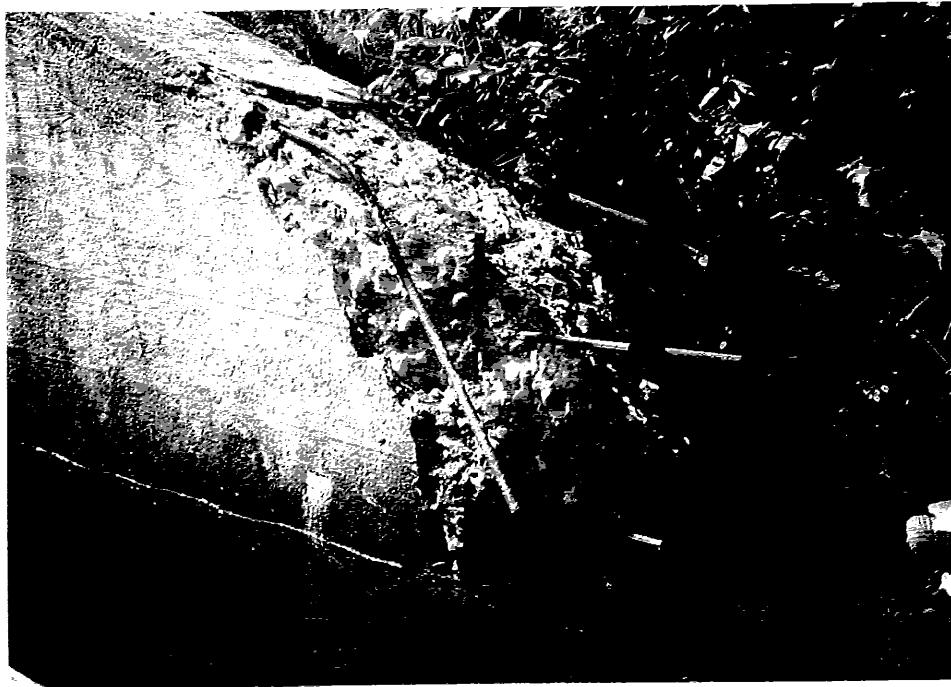


Photo 5: A 3' long, 15" wide section of the northwest wingwall is deteriorated down to the channel bottom. *Note the sections of exposed rebar at the spalled area.*

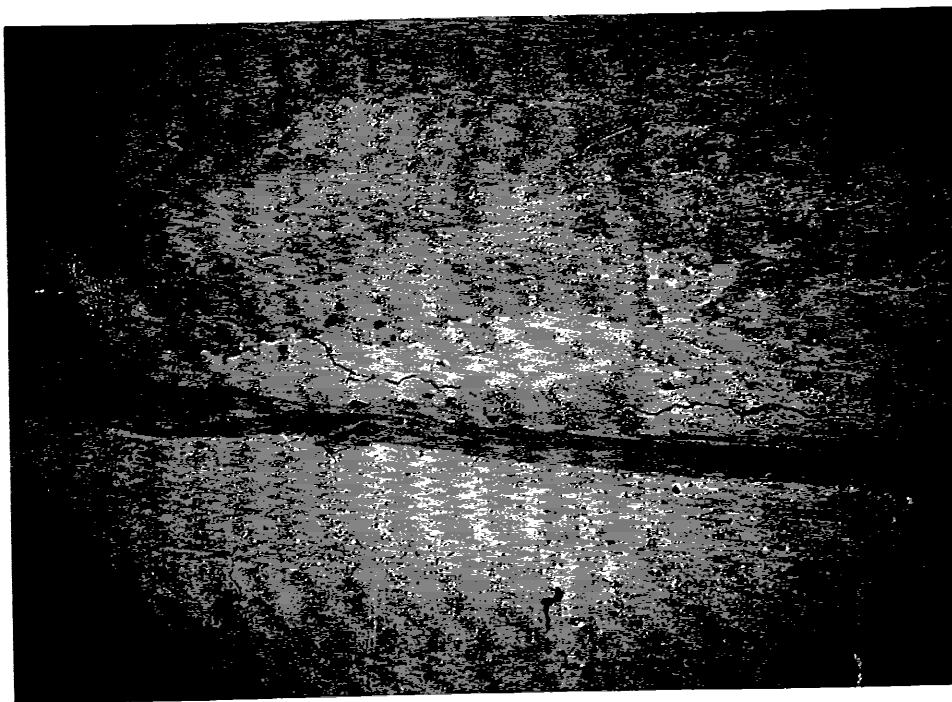


Photo 6: A full length,  $\frac{1}{8}$ " wide horizontal crack between girders 2 and 3 at the west bridge seat.

EAST BRIMFIELD LAKE  
OLD MORSE ROAD BRIDGE  
HOLLAND, MASSACHUSETTS  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

17 June 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection,	2 May	96
Routine Inspection,	21 June	94
Routine Inspection,	16 June	92
Routine Inspection,	26 June	90
Inventory Inspection,	26 Mar	84

BRIDGE DESCRIPTION AND HISTORY

The bridge, built in 1939, is a three span, continuous, non-composite steel stringer structure which carries Old Morse Road over the Quinebaug River at the East Brimfield Lake Reservoir. The spans measure 20' each from center to center of bearings. The bridge roadway is 20' between concrete curbs. Old Morse Road ends approximately 200' beyond the bridge. The bridge is closed to traffic and functions only as a pedestrian bridge.

The superstructure consists of six wide flange rolled beams spaced at 4'-2" on center. The four interior stringers are 16WF40 sections and the fascia stringers are 16WF45 sections. The stringers support a 6 1/2" reinforced concrete deck, overlaid with 2" of bituminous concrete on a 1" gravel base.

The substructure consists of two gravity type concrete abutments and U-walls, and two timber pile bents. The two bents consist of six timber piles each with cross bracing and timber caps.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	15T	27T	No change in rating.
3	20T	35T	
3S2	31T	54T	

EVALUATION (See attached "Structures Inspection Field Report")

A. Approach Roadway

Both the east and west approach roadways are in poor condition. Sections of bituminous paving are missing at the east approach. There is a  $1 \frac{3}{4}$ " difference at the transition between the bridge deck and the approach roadway. Alignment at the east approach is poor as the road curves moderately to the south. The west approach roadway ends approximately 200' beyond the bridge. The bridge is load posted at 18, 21, and 33 tons, which differ from the bridge rating values. The concrete posts and cable approach guardrails are in poor condition with loose and corroded cables.

B. Deck

The overall condition of the bridge deck is poor. There is heavy vegetation at the edges of the deck, and approximately 2' of the bituminous paving is missing on each side of the deck. The bridge guardrails are in fair condition, with moderate surface rusting and pitting. There is moderate spalling and efflorescence at the south parapet and curb.

C. Superstructure

The superstructure is in overall fair condition. There is moderate surface corrosion on all the steel members with no observed section loss.

D. Substructure

The east and west abutments are in good condition. There is minor amount of debris accumulated at the abutments. Timber piles and caps above the water line appear to be in good condition. There are missing nuts and washers at both the timber bents.

E. Channel

Both the upstream and downstream alignments are good. Water levels deepen at the timber bents and are too high to allow inspection for scour. There was no scour noted at the abutments which are accessible.



### CONDITION RATING

Routine, 1998	5
Routine, 1996	6
Routine, 1994	6
Routine, 1992	6
Routine, 1990	6
Inventory, 1984	5

### RECOMMENDATIONS

#### A. Status of Previous Recommendations

Bridge to undergo rehabilitation if reopened to traffic.

#### B. Revised Recommendations

Same recommendation.

Estimated Cost of Rehabilitation  
required to reopen bridge: \$75,000.00

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>HOLLAND, MA</b>		bridge dept. no. <b>—</b>	8-structure no. <b>CEPNE DMA 2510003</b>	90-date inspected <b>17 JUNE 1998</b>	
1. 104-highway system <b>0 - NOT ON NHS</b>	22-owner <b>ARMY CORPS OF ENGINEERS</b>	27-year built <b>1939</b>	106-year rebuilt <b>—</b>	11-milepoint <b>—</b>	
43-structure type <b>HQ2 - 3 SPAN CONTINUOUS STEEL STRINGER</b>			quality control engineer <b>NICK FORBES</b>		
07-facility carried <b>OLD MORSE ROAD</b>			team leader <b>JOE COLUCCI</b>		
06-features intersected <b>QUINEBAUG RIVER</b>			team members <b>JENNIFER LEE &amp; ED MILLS</b>		

<p>item 58 <span style="float: right;"><b>4</b></span></p> <p>DECK</p> <ol style="list-style-type: none"> <li>1. Wearing Surface <span style="float: right;"><b>4</b></span></li> <li>2. Deck-Condition <span style="float: right;"><b>5</b></span></li> <li>3. Stay in Place Forms <span style="float: right;"><b>NA</b></span></li> <li>4. Curbs <span style="float: right;"><b>4</b></span></li> <li>5. Median <span style="float: right;"><b>NA</b></span></li> <li>6. Sidewalks <span style="float: right;"><b>NA</b></span></li> <li>7. Parapet <span style="float: right;"><b>4</b></span></li> <li>8. Railing <span style="float: right;"><b>5</b></span></li> <li>9. Anti Missile Fence <span style="float: right;"><b>NA</b></span></li> <li>10. Drains <span style="float: right;"><b>NA</b></span></li> <li>11. Lighting Standards <span style="float: right;"><b>NA</b></span></li> <li>12. Utilities <span style="float: right;"><b>NA</b></span></li> <li>13. Deck Joints <span style="float: right;"><b>NA</b></span></li> <li>14. Approach Settlement <span style="float: right;"><b>4</b></span></li> </ol>	<p>item 59 <span style="float: right;"><b>5</b></span></p> <p>SUPERSTRUCTURE</p> <ol style="list-style-type: none"> <li>1. Bearing Devices <span style="float: right;"><b>6</b></span></li> <li>2. Stringers <span style="float: right;"><b>6</b></span></li> <li>3. Diaphragms <span style="float: right;"><b>6</b></span></li> <li>4. Girders or Beams <span style="float: right;"><b>NA</b></span></li> <li>5. Floor Beams <span style="float: right;"><b>NA</b></span></li> <li>6. Trusses <span style="float: right;"><b>NA</b></span></li> <li>7. Rivets or Bolts <span style="float: right;"><b>5</b></span></li> <li>8. Welds <span style="float: right;"><b>NA</b></span></li> <li>9. Collision Damage <span style="float: right;"><b>NA</b></span></li> <li>10. Load Deflection <span style="float: right;"><b>NA</b></span></li> <li>11. Member Alignment <span style="float: right;"><b>7</b></span></li> <li>12. Load Vibration <span style="float: right;"><b>NA</b></span></li> <li>13. Paint-Epoxy <span style="float: right;"><b>5</b></span></li> <li>14. Year Painted <span style="float: right;"><b>—</b></span></li> <li>15. Under Clearance <span style="float: right;"><b>NA</b></span> ft <span style="float: right;"><b>—</b></span> in</li> </ol> <p>Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no</p>	<p>item 60 <span style="float: right;"><b>7</b></span></p> <p>SUBSTRUCTURE</p> <ol style="list-style-type: none"> <li>1. Abutments               <ol style="list-style-type: none"> <li>a-Wings <span style="float: right;"><b>NA</b></span></li> <li>b-Backwall <span style="float: right;"><b>7</b></span></li> <li>c-Bridge Seats <span style="float: right;"><b>7</b></span></li> <li>d-Breastwall <span style="float: right;"><b>7</b></span></li> <li>e-Footings <span style="float: right;"><b>NA</b></span></li> <li>f-Piles <span style="float: right;"><b>NA</b></span></li> <li>g-Erosion <span style="float: right;"><b>7</b></span></li> <li>h-Settlement <span style="float: right;"><b>7</b></span></li> </ol> </li> <li>2. Piers or Bents               <ol style="list-style-type: none"> <li>a-Caps <span style="float: right;"><b>6</b></span></li> <li>b-Column <span style="float: right;"><b>NA</b></span></li> <li>c-Web <span style="float: right;"><b>NA</b></span></li> <li>d-Footing <span style="float: right;"><b>NA</b></span></li> <li>e-Piles <span style="float: right;"><b>6</b></span></li> <li>f-Scour <span style="float: right;"><b>NA</b></span></li> <li>g-Settlement <span style="float: right;"><b>7</b></span></li> </ol> </li> <li>3. Collision Damage <span style="float: right;"><b>8</b></span></li> <li>4. Hydraulic Adequacy <span style="float: right;"><b>8</b></span></li> </ol>
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<p>Actual Posting</p> <p style="text-align: center;">H 3 3S2</p> <p style="text-align: center;"><b>18 21 33</b></p> <p>Recommended Posting From Rating Book</p> <p style="text-align: center;"><b>15 20 31</b></p>	<p>Single</p> <p style="text-align: center;"><b>N</b></p> <p>advance</p> <p style="text-align: center;"><b>7</b></p>	<p>Overhead Signs (attached to bridge)</p> <p><input type="checkbox"/> yes <input checked="" type="checkbox"/> no</p> <ol style="list-style-type: none"> <li>1. Welds <span style="float: right;"><input type="checkbox"/></span></li> <li>2. Bolts <span style="float: right;"><input type="checkbox"/></span></li> <li>3. Condition <span style="float: right;"><input type="checkbox"/></span></li> </ol>
<p>SIGNS IN PLACE</p> <p>Y or N <span style="float: right;"><b>NA</b></span></p> <p>LEGIBILITY <span style="float: right;"><b>NA</b></span></p>		<p>Item 93b U/W Inspection Date: <b>NA</b></p>

<p>ITEM 61-channel and channel protection <span style="float: right;"><b>7</b></span></p> <ol style="list-style-type: none"> <li>1. channel scour <span style="float: right;"><b>7</b></span></li> <li>2. embankment erosion <span style="float: right;"><b>7</b></span></li> <li>3. fender system <span style="float: right;"><b>NA</b></span></li> <li>4. spur dikes &amp; jetties <span style="float: right;"><b>NA</b></span></li> <li>5. rip rap or slope paving <span style="float: right;"><b>7</b></span></li> <li>6. effectiveness <span style="float: right;"><b>7</b></span></li> <li>7. debris <span style="float: right;"><b>8</b></span></li> <li>8. vegetation <span style="float: right;"><b>7</b></span></li> </ol>	<p>36-Traffic Safety features</p> <table style="width: 100%;"> <tr> <td></td> <td style="text-align: center;">36</td> <td style="text-align: center;">condition</td> </tr> <tr> <td>1. bridge railing</td> <td style="text-align: center;"><b>1</b></td> <td style="text-align: center;"><b>5</b></td> </tr> <tr> <td>2. transitions</td> <td style="text-align: center;"><b>0</b></td> <td style="text-align: center;"><b>5</b></td> </tr> <tr> <td>3. approach guardrail</td> <td style="text-align: center;"><b>0</b></td> <td style="text-align: center;"><b>5</b></td> </tr> <tr> <td>4. guardrail terminal</td> <td style="text-align: center;"><b>0</b></td> <td style="text-align: center;"><b>5</b></td> </tr> </table>		36	condition	1. bridge railing	<b>1</b>	<b>5</b>	2. transitions	<b>0</b>	<b>5</b>	3. approach guardrail	<b>0</b>	<b>5</b>	4. guardrail terminal	<b>0</b>	<b>5</b>
	36	condition														
1. bridge railing	<b>1</b>	<b>5</b>														
2. transitions	<b>0</b>	<b>5</b>														
3. approach guardrail	<b>0</b>	<b>5</b>														
4. guardrail terminal	<b>0</b>	<b>5</b>														

**X=UNKNOWN**
**NA=NOT APPLICABLE**
**IA=INACCESSIBLE**

PROJECT: EAST BRIMFIELD LAKE  
NAME: OLD MORSE ROAD  
LOCATION: HOLLAND, MA

BRIDGE INSPECTION  
SCOUR CHECKLIST

1. Is the bridge currently experiencing, or does it have a history of, scour activity?

NO

2. Is the streambed erodible? If so, does the structure have any vulnerable design features?

YES

a. Piers, abutments with spread footings or short pile foundations.

YES

b. Superstructure with simple spans or non-redundant support systems.

NO

c. Inadequate waterway openings.

NO

d. Designs which collect ice and debris.

NO

e. All water must pass through or over structure.

YES

f. Other.

3. Are any characteristics of an aggressive stream or waterway present?

NO

a. Active degradation or aggradation of streambed.

NO

b. Significant lateral movement or erosion of streambanks.

NO

c. Steep slopes.

NO

d. High velocities.

NO

e. Any history of highway or bridge damage during past floods.

NO

f. Other.

4. Is the bridge located on a stream reach with any adverse flow characteristics?

NO

a. Crossing near stream confluence.

NO

b. Crossing of tributary stream near confluence with larger streams.

NO

c. Crossing on sharp bend in stream.

NO

d. Location on alluvial fan.

NO

e. Other.

5. Other comments or observations.

NO

## NBI Metric Structural Inventory and Appraisal

Date Printed: 09/02/1998

(202) Corps of Engineers Structure Number: CEPNEDMA2510003

(8) NBI Structure Number: CEPNEDMA2510003

## Geographic and Route Data

## Dimensional Data

## Inspection Data

(1) State Massachusetts  
 (2) District 00  
 (3) County 000  
 (4) Place 00000  
 (6) Feature Under QUINEBAUG RIVER  
 (7) Facility on OLD MORSE ROAD  
 (9) Location 6.4 KM W OF STURBRIDGE MA  
 (16) Latitude 42° 05' 30.00"  
 (17) Longitude 072° 05' 54.00"  
 (98) Border Bridge  
 (99) Border Bridge Str No  
 (103) Temporary Str

(32) Approach Rdwy Width 6.1 M  
 (39) Navigation Vert Clr 0.0 M  
 (40) Navigation Horz Clr 0.0 M  
 (48) Max Span Length 0006.1 M  
 (49) Str Length 00018.3 M  
 (50) Curb/Sidewalk Width Left 00.3 M  
 Right 00.3 M  
 (51) Brg Rdwy Width, curb-curb 006.1 M  
 (52) Deck Width out-out 006.7 M  
 (53) Min Vert Clr over 99.99 M  
 (54) Min Vert Clr under N 00.00 M  
 (55) Min Lat Underclr R N 00.0 M  
 (56) Min Lat Underclr L 99.9 M  
 (112) NBIS Bridge Length Y  
 (116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0698  
 (91) Inspection Frequency 24 Mo  
 (92) Critical Feature Insp (93) Date  
 Frac Crit Insp : N 00 /  
 Underwater Insp: N 00 /  
 Other Spec Insp: N 00 /

## On and Under Record Data

## Route On

(5) Inventory Route 168000000  
 (10) Min Vert Clr 99.99 M  
 (11) Kilometer Point 0000.000  
 (19) Detour Length 199 km  
 (20) Toll 3  
 (26) Func Class 09  
 (28) Lanes on/under 0200  
 (29) ADT 10  
 (30) Year of ADT 1998  
 (47) Total Horz Clearance 06.1 M  
 (100) Defense Hwy 0  
 (101) Parallel Str N  
 (102) Direction of Traffic 2  
 (104) Hwy System 0  
 (109) Truck Traffic 00%  
 (110) Natl Truck Network No

## Proposed Improvements

(75) Type of Work  
 (76) Improvement Length 000000 M  
 (94) Bridge Improv Cost 0  
 (95) Rdwy Improv Cost 0  
 (96) Total Proj Cost 0  
 (97) Year of Cost Est 0000  
 (114) Future ADT 0  
 (115) Year of Future ADT 2015

## Condition Rating

(58) Deck 4  
 (59) Superstructure 5  
 (60) Substructure 7  
 (61) Channel & Channel Protect 7  
 (62) Culverts N

## General Data

(21) Maintenance Responsibility 70  
 (22) Owner 70  
 (31) Design Load 2  
 (33) Bridge Median 0  
 (34) Skew 00 deg  
 (35) Str Flared No  
 (37) Hist Significance 5  
 (38) Navigation Control 0  
 (42) Type of Service 35  
 (43) Structure Type Main 402  
 (44) Structure Type Approach 000  
 (45) No of Span Main 003  
 (46) No of Approach Spans 0000  
 (27) Year Built 1939  
 (106) Year Reconstructed 0000  
 (107) Deck Str Type 1  
 (108) Wear Surf/Protv Sys 600  
 (111) Nav Pier/Abut Protection

## Appraisal Rating

(67) Structure Evaluation 0  
 (68) Deck Geometry 5  
 (69) Underclrn Vert & Horz N  
 (71) Waterway Adequacy 8  
 (72) Approach Rdwy Alignment 8  
 (36) Traffic Safety Features 1000  
 (113) Scour Critical Bridges 5

## Load Rate and Post

(41) Str Open/Post/Close Closed  
 (64) Operating Rating 00.0 ton  
 (66) Inventory Rating 00.0 ton  
 (70) Bridge Posting 5

Sufficiency Rating = 036.6  
 Structurally Deficient

## Over 200 Items

(200) COE MSC CENAD  
 (201) COE District CENAE  
 (202) Structure Number CEPNEDMA2510003  
 (203) Inspection Office EPDG  
 (204) Inspector JOE COLUCCI  
 (205) Inspection Cost 005000  
 (206) Cooper's Loading  
 (207) Railroad Stru Number  
 (208) Name of Railroad  
 (209) Recommended Speed Limit  
 (210) Posted Speed Limit (KPH)  
 (211) MACOM  
 (212) Installation Name  
 (213) Military Wheel Load Class  
 (214) Military Truck Load Class  
 (215) Installation Number  
 (216) Seismic Category  
 (217) Acceleration Coefficient 0.00  
 (218) Soil Site Coefficient 0.0

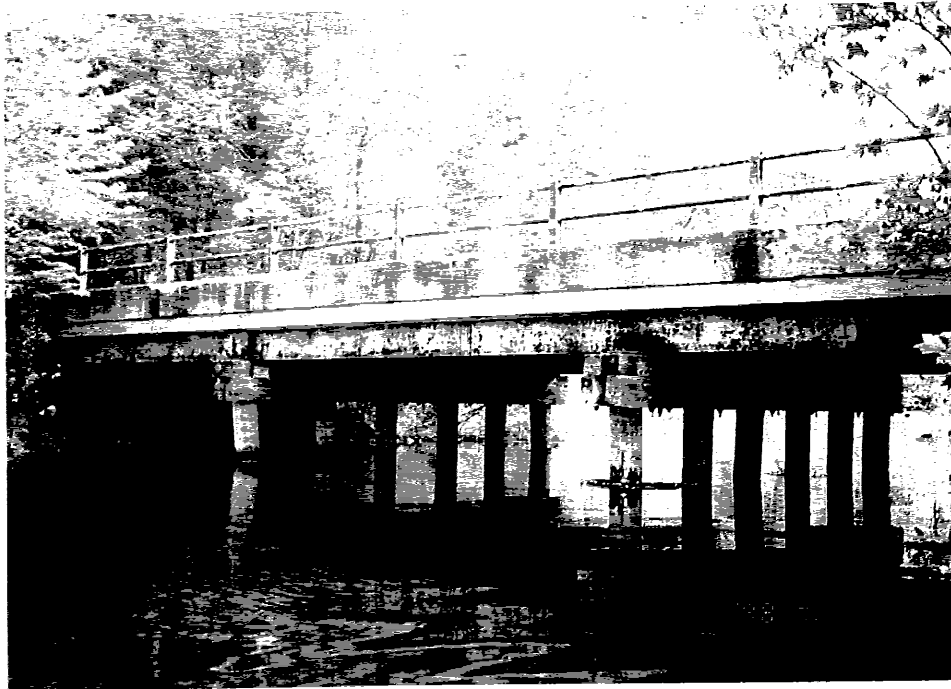


Photo 1: South elevation of Old Morse Road Bridge. Note the moderate rusting of the guardrails, the extensive spalling of the parapet, and the moderate surface corrosion of the steel beams.



Photo 2: The bridge deck and the east approach roadway. Note the missing sections of the bituminous approach paving and the heavy vegetation at the edges of the deck

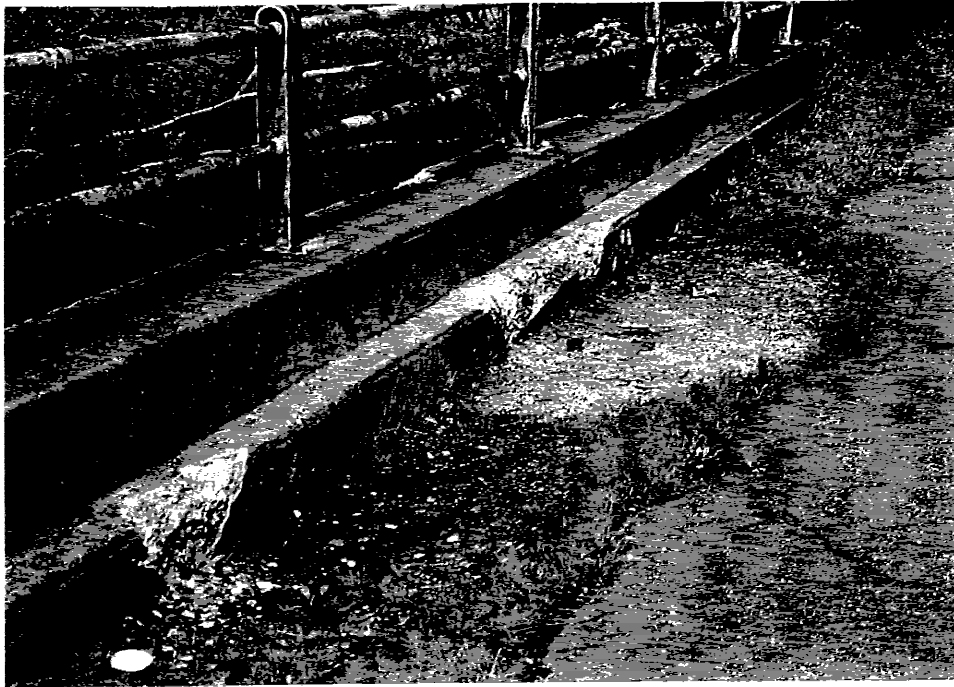


Photo 3: Extensive spalling of the south curb and parapet. Note also the missing bituminous paving and the heavy vegetation.

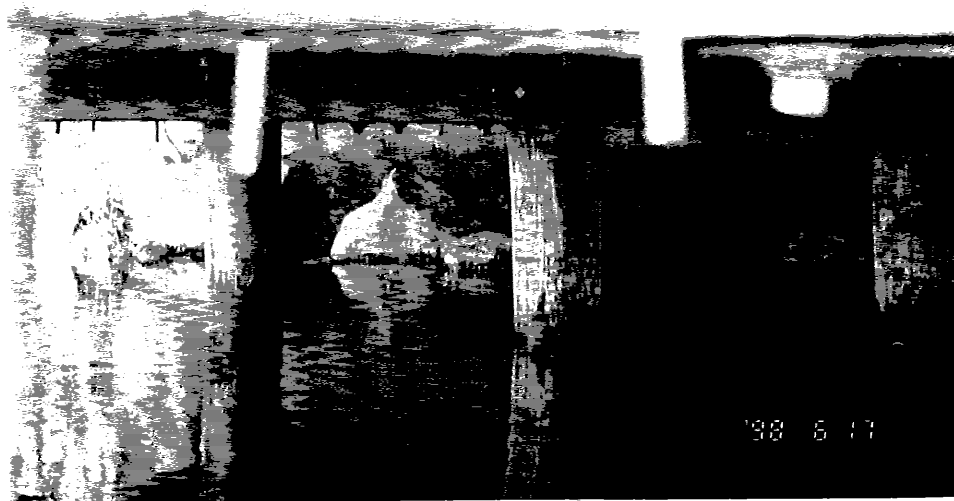


Photo 4: Elevation of the west bent and abutment. Note the missing nuts and washers at both the timber bents.

THOMASTON DAM  
SPILLWAY BRIDGE  
THOMASTON, CONNECTICUT  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

22 June 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection,	26	Aug	96
Routine Inspection,	25	Aug	94
Routine Inspection,	05	Aug	92
Routine Inspection,	29	Aug	90
Routine Inspection,	24	Aug	88
Inventory Inspection,	15	May	84

BRIDGE DESCRIPTION AND HISTORY

The spillway bridge at Thomaston, Connecticut is a 114'-6" long single span welded plate girder structure constructed in 1960. The bridge length center to center of bearings is 112'-6". The roadway width across the bridge is 20'-0". On each side of the deck, there are 1'-0" wide by 10" high curbs. The curbs support a new (FY 95) aluminum bridge rail system.

According to the record drawings, the composite action concrete deck is supported by three 72" deep welded plate girders spaced at 8'-6" on center. The deck varies in depth from 11 1/2" at the centerline to 9" at the fascia. Diaphragms are spaced at 14'-0" except at the bearing ends where spacing is 14'-3".

The east abutment is a stub type (concrete cap and backwall set on a rock shelf) with a breast wall extending to the bottom of the spillway. The wingwalls at this abutment are also stub types extending from the backwall to the adjacent rock. The west abutment is an integral part of the west spillway wall.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	33T	61T	No change in rating.
3	50T	93T	
3S2	59T	180T	
3-3	63T	117T	

EVALUATION (See attached "Structures Inspection Field Report")

A. Approach Roadway

Both the east and west approach roadways are in good condition. Alignment is good on both approaches. The bituminous pavement sections leading up to the abutment backwalls of the east and west approaches are in good condition, with a few crack repairs noted. The fence and rails at the parking area adjacent to the approach are in good condition. The guardrail leading into the parking lot has collision damage. There is no approach guardrail at either side of the east approach roadway. There are no load rating signs at either approach.

B. Deck

The surface of the bridge deck is abraded and has numerous spalls and popouts, measuring up to  $1\frac{1}{2}$ " deep. Project personnel have patched the deck with concrete in several areas. Sections of concrete have spalled off at the east abutment backwall that transitions to the bridge deck. Drainage scuppers show discoloration due to corrosion. Deck joints are in good condition. Debris has built up in the west joint. Paint is missing from the deck joint at the east abutment, probably due to snow plow action. The underside of the expansion joint plate has moderate corrosion and is staining the backwall. The small spall at the southeast corner of the underside of the deck has not further deteriorated since the last inspection. The bridge railings are in very good condition. However, due to the amount of pedestrian traffic, installation of a higher safety/antimissile fence is recommended. The curb edge at the southwest corner was cracked from the new railing installation but is not a concern at this time.

C. Superstructure

The overall condition of the steel superstructure is fair to good. There is moderate to severe corrosion and section loss of the bottom flange of girder 1 (numbered north to south) at the first three sections (between diaphragms) adjacent to the bridge seat. Girders 2 and 3 are similarly corroded to a lesser degree than girder 1. The corrosion was caused by seepage through the electrical conduits. This seepage problem has since been corrected by the installation of the PVC drain from the utility manhole. The extent of section loss in these areas has not progressed to a point at which member capacities are affected; however, these areas should be thoroughly cleaned and painted to arrest any further deterioration. It was determined from the original design specifications that the original paint used on the bridge is lead based. Therefore, it seems logical and cost



effective that the rest of the bridge be painted at the same time as the three sections of corroded girders. Remaining sections of the girders are in good condition with light corrosion noted at the top flanges of some diaphragms. The east and west bearings are in good condition with minor rusting evident. The underside of the bottom flange and outside web of girders 1 and 3 were not painted during the recent (FY 94 or 95) contract. One nut at the fixed bearing at girder 3 has unwound nearly to the top of the anchor bolt (1" gap between the washer and nut). There is vegetation growing on the bridge seat of the west abutment near the bearings.

#### D. Substructure

The overall condition of the east and west abutments is good. There is a moderate amount of debris and guano on the east abutment bridge seat. The PVC drain added through the backwall of the abutment extends past the bridge seat but drains onto the shelf. Because of this, the water drainage is abrading the top of the shelf. Two cracks were noted on the concrete shelf. The  $\frac{1}{8}$ " crack located under the middle girder extends the full width of the shelf and terminates at the vertical joint of the breastwall. It appears there should have been a joint at the shelf. The second hairline crack beneath girder 3 runs across  $\frac{3}{4}$  of the shelf width. Abrasion is evident under the drainage holes at the east abutment on either side of the bridge, with abrasion at the north hole more severe than that at the south. The abraded area below the north drain measures 1' wide x 3' high x  $\frac{1}{4}$ " deep. The abrasion beneath the south drain measures 2' x 4' x  $\frac{1}{8}$ " deep. Drainage water from these two drains flows down behind the abutment breastwall and may cause serious structural damage if freeze/thaw action were to take place. Numerous cracks with efflorescence are present on the backside of the exposed south backwall adjacent to the drain and the east approach roadway. The weepholes in the training walls beneath the east abutment are functioning as evidenced by the moss growing below the holes. Efflorescence is present at several joints along the wall. The west abutment is in very good condition with the new bridge seat. However, it appears the side wall of the bridge seat was cast flush with the bridge on the north side. There is minor amount of vegetation growth on the bridge seat.

#### E. Channel

The spillway channel is generally dry. The channel orientation is very good.

## CONDITION RATING

Routine, 1998	6
Routine, 1996	7
Routine, 1994	6
Routine, 1992	7
Routine, 1990	6
Routine, 1988	7
Inventory, 1984	7

## RECOMMENDATIONS

### A. Status of Previous Recommendations

Sandblast and paint ends of girders 1 and 2 (42' minimum) at east abutment. Bridge is assumed to have lead-based primer. Eliminate seepage at electrical conduits.

Extend PVC drain at east abutment to extend beyond the end of the shelf below the bridge seat.

Scarify existing bridge deck and add concrete overlay to a minimum depth of 1 <sup>3</sup>/<sub>4</sub>". Seal with penetrating sealant.

### B. Revised Recommendations

Clean and scarify the spillway access bridge deck and apply an epoxy prime coat to entire deck followed by two layers of epoxy deck overlay material. Maintain vehicular access on one half of the bridge deck at all times.

Estimated Cost: \$20,000

Extend PVC drain at east abutment to extend beyond the end of the shelf below the bridge seat.

Estimated Cost: \$500

Blast clean, prime, and paint all three girders, diaphragms, and bearings.

Estimated Cost: \$175,000

Install 8' chain link safety fencing at the spillway access bridge railings.

Estimated Cost: \$25,000

Provide seepage control at the expansion joint (east abutment) to eliminate any further water damage.

Estimated Cost: \$2,500

All Work Scheduled For FY 99 Design. Total Estimate: \$223,000

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>THOMASTON, CT</b>		bridge dept. no.		8-structure no. <b>CEPNEDCT0910002</b>		90-date inspected <b>22 JUNE 1998</b>	
st.	104-highway system <b>Ø - NOT ON NHS</b>	22-owner <b>ARMY CORPS OF ENGINEERS</b>	27-year built <b>1960</b>	106-year rebuilt <b>—</b>	11-milepoint		
43-structure type <b>302 - STEEL GIRDER</b>				quality control engineer <b>NICK FORBES</b>			
07-facility carried <b>DAM ACCESS ROAD</b>				team leader <b>JOE COLUCCI</b>			
06-features intersected <b>THOMASTON DAM SPILLWAY CHANNEL</b>				team members <b>JENNIFER LEE ; ED HILLS</b>			

<p>item 58 <span style="float: right;"><b>6</b></span></p> <p>DECK</p> <ol style="list-style-type: none"> <li>1. Wearing Surface <span style="float: right;"><b>5</b></span></li> <li>2. Deck-Condition <span style="float: right;"><b>6</b></span></li> <li>3. Stay in Place Forms <span style="float: right;"><b>NA</b></span></li> <li>4. Curbs <span style="float: right;"><b>7</b></span></li> <li>5. Median <span style="float: right;"><b>NA</b></span></li> <li>6. Sidewalks <span style="float: right;"><b>NA</b></span></li> <li>7. Parapet <span style="float: right;"><b>NA</b></span></li> <li>8. Railing <span style="float: right;"><b>9</b></span></li> <li>9. Anti Missile Fence <span style="float: right;"><b>NA</b></span></li> <li>10. Drains <span style="float: right;"><b>8</b></span></li> <li>11. Lighting Standards <span style="float: right;"><b>NA</b></span></li> <li>12. Utilities <span style="float: right;"><b>5</b></span></li> <li>13. Deck Joints <span style="float: right;"><b>7</b></span></li> <li>14. Approach Settlement <span style="float: right;"><b>7</b></span></li> </ol>	<p>item 59 <span style="float: right;"><b>6</b></span></p> <p>SUPERSTRUCTURE</p> <ol style="list-style-type: none"> <li>1. Bearing Devices <span style="float: right;"><b>7</b></span></li> <li>2. Stringers <span style="float: right;"><b>NA</b></span></li> <li>3. Diaphragms <span style="float: right;"><b>7</b></span></li> <li>4. Girders or Beams <span style="float: right;"><b>6</b></span></li> <li>5. Floor Beams <span style="float: right;"><b>NA</b></span></li> <li>6. Trusses <span style="float: right;"><b>NA</b></span></li> <li>7. Rivets or Bolts <span style="float: right;"><b>8</b></span></li> <li>8. Welds <span style="float: right;"><b>8</b></span></li> <li>9. Collision Damage <span style="float: right;"><b>8</b></span></li> <li>10. Load Deflection <span style="float: right;"><b>8</b></span></li> <li>11. Member Alignment <span style="float: right;"><b>8</b></span></li> <li>12. Load Vibration <span style="float: right;"><b>8</b></span></li> <li>13. Paint-Epoxy <span style="float: right;"><b>6</b></span></li> <li>14. Year Painted <span style="float: right;"><b>'87</b></span></li> <li>15. Under Clearance <span style="float: right;">_____ ft _____ in</span></li> </ol> <p>Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no</p>	<p>item 60 <span style="float: right;"><b>7</b></span></p> <p>SUBSTRUCTURE</p> <ol style="list-style-type: none"> <li>1. Abutments               <ol style="list-style-type: none"> <li>a-Wings <span style="float: right;"><b>7</b></span></li> <li>b-Backwall <span style="float: right;"><b>7</b></span></li> <li>c-Bridge Seats <span style="float: right;"><b>7</b></span></li> <li>d-Breastwall <span style="float: right;"><b>7</b></span></li> <li>e-Footings <span style="float: right;"><b>NA</b></span></li> <li>f-Piles <span style="float: right;"><b>NA</b></span></li> <li>g-Erosion <span style="float: right;"><b>8</b></span></li> <li>h-Settlement <span style="float: right;"><b>8</b></span></li> </ol> </li> <li>2. Piers or Bents               <ol style="list-style-type: none"> <li>a-Caps <span style="float: right;"><b>NA</b></span></li> <li>b-Column <span style="float: right;"><b>NA</b></span></li> <li>c-Web <span style="float: right;"><b>NA</b></span></li> <li>d-Footing <span style="float: right;"><b>NA</b></span></li> <li>e-Piles <span style="float: right;"><b>NA</b></span></li> <li>f-Scour <span style="float: right;"><b>NA</b></span></li> <li>g-Settlement <span style="float: right;"><b>NA</b></span></li> </ol> </li> <li>3. Collision Damage <span style="float: right;"><b>8</b></span></li> <li>4. Hydraulic-Adequacy <span style="float: right;"><b>8</b></span></li> </ol>
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<p>Actual Posting <span style="float: right;">H 3 3S2</span></p> <p style="text-align: center;"><b>N N N</b></p> <p>Recommended Posting From Rating Book <span style="float: right;"><b>33 50 59</b></span></p> <p>SIGNS IN PLACE at bridge advance</p> <p>Y or N <span style="float: right;"><b>N</b></span> <span style="float: right;"><b>N</b></span></p> <p>LEGIBILITY <input type="checkbox"/> <input type="checkbox"/></p>	<p>Overhead Signs (attached to bridge)</p> <p><input type="checkbox"/> yes <input checked="" type="checkbox"/> no</p> <ol style="list-style-type: none"> <li>1. Welds <span style="float: right;"><input type="checkbox"/></span></li> <li>2. Bolts <span style="float: right;"><input type="checkbox"/></span></li> <li>3. Condition <span style="float: right;"><input type="checkbox"/></span></li> </ol> <p>Item 93b U/W Inspection Date: <b>NA</b></p>
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<p>ITEM 61-channel and channel protection <span style="float: right;"><b>8</b></span></p> <table style="width: 100%;"> <tr> <td>1. channel scour <span style="float: right;"><b>8</b></span></td> <td>5. rip rap or slope paving <span style="float: right;"><b>8</b></span></td> </tr> <tr> <td>2. embankment erosion <span style="float: right;"><b>8</b></span></td> <td>6. effectiveness <span style="float: right;"><b>8</b></span></td> </tr> <tr> <td>3. fender system <span style="float: right;"><b>NA</b></span></td> <td>7. debris <span style="float: right;"><b>8</b></span></td> </tr> <tr> <td>4. spur dikes &amp; jetties <span style="float: right;"><b>NA</b></span></td> <td>8. vegetation <span style="float: right;"><b>8</b></span></td> </tr> </table>	1. channel scour <span style="float: right;"><b>8</b></span>	5. rip rap or slope paving <span style="float: right;"><b>8</b></span>	2. embankment erosion <span style="float: right;"><b>8</b></span>	6. effectiveness <span style="float: right;"><b>8</b></span>	3. fender system <span style="float: right;"><b>NA</b></span>	7. debris <span style="float: right;"><b>8</b></span>	4. spur dikes & jetties <span style="float: right;"><b>NA</b></span>	8. vegetation <span style="float: right;"><b>8</b></span>	<p>36-Traffic Safety features</p> <table style="width: 100%;"> <tr> <td>1. bridge railing <span style="float: right;"><b>1</b></span></td> <td>36 condition <span style="float: right;"><b>9</b></span></td> </tr> <tr> <td>2. transitions <span style="float: right;"><b>N</b></span></td> <td><span style="float: right;"><b>NA</b></span></td> </tr> <tr> <td>3. approach guardrail <span style="float: right;"><b>N</b></span></td> <td><span style="float: right;"><b>NA</b></span></td> </tr> <tr> <td>4. guardrail terminal <span style="float: right;"><b>N</b></span></td> <td><span style="float: right;"><b>NA</b></span></td> </tr> </table>	1. bridge railing <span style="float: right;"><b>1</b></span>	36 condition <span style="float: right;"><b>9</b></span>	2. transitions <span style="float: right;"><b>N</b></span>	<span style="float: right;"><b>NA</b></span>	3. approach guardrail <span style="float: right;"><b>N</b></span>	<span style="float: right;"><b>NA</b></span>	4. guardrail terminal <span style="float: right;"><b>N</b></span>	<span style="float: right;"><b>NA</b></span>
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**X=UNKNOWN**
**NA=NOT APPLICABLE**
**IA=INACCESSIBLE**

NBI Metric Structural Inventory and Appraisal

Date Printed: 09/01/1998

(202) Corps of Engineers Structure Number: CEPNEDCT0910002

(8) NBI Structure Number: CEPNEDCT0910002

Geographic and Route Data

Dimensional Data

Inspection Data

(1) State Connecticut  
(2) District 04  
(3) County 005  
(4) Place 75730  
(6) Feature Under SPILLWAY CHANNEL  
(7) Facility on ACCESS ROAD  
(9) Location .80 KM E CT RTE. 8  
(16) Latitude 41° 40' 00.00"  
(17) Longitude 073° 30' 00.00"  
(98) Border Bridge  
(99) Border Bridge Str No  
(103) Temporary Str

(32) Approach Rdwy Width 6.1 M  
(39) Navigation Vert Clr 0.0 M  
(40) Navigation Horz Clr 0.0 M  
(48) Max Span Length 0034.3 M  
(49) Str Length 00034.9 M  
(50) Curb/Sidewalk Width Left 00.3 M  
Right 00.3 M  
(51) Brg Rdwy Width, curb-curb 006.1 M  
(52) Deck Width out-out 006.7 M  
(53) Min Vert Clr over 99.99 M  
(54) Min Vert Clr under N 00.00 M  
(55) Min Lat Underclr R N 00.0 M  
(56) Min Lat Underclr L 00.0 M  
(112) NBIS Bridge Length Y  
(116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0698  
(91) Inspection Frequency 24 Mo  
(92) Critical Feature Insp (93) Date  
Frac Crit Insp : N /  
Underwater Insp: N /  
Other Spec Insp: N /

On and Under Record Data

Route On

(5) Inventory Route 168000000  
(10) Min Vert Clr 99.99 M  
(11) Kilometer Point 0000.000  
(19) Detour Length 199 km  
(20) Toll 3  
(26) Func Class 09  
(28) Lanes on/under 0200  
(29) ADT 40  
(30) Year of ADT 1998  
(47) Total Horz Clearance 06.1 M  
(100) Defense Hwy 0  
(101) Parallel Str N  
(102) Direction of Traffic 2  
(104) Hwy System 0  
(109) Truck Traffic 05%  
(110) Natl Truck Network No

Proposed Improvements

(75) Type of Work 351  
(76) Improvement Length 000349 M  
(94) Bridge Improv Cost 223  
(95) Rdwy Improv Cost 0  
(96) Total Proj Cost 223  
(97) Year of Cost Est 1998  
(114) Future ADT 40  
(115) Year of Future ADT 2015

Condition Rating

(58) Deck 6  
(59) Superstructure 6  
(60) Substructure 7  
(61) Channel & Channel Protect 8  
(62) Culverts N

General Data

(21) Maintenance Responsibility 70  
(22) Owner 70  
(31) Design Load 2  
(33) Bridge Median 0  
(34) Skew 00 deg  
(35) Str Flared No  
(37) Hist Significance 5  
(38) Navigation Control N  
(42) Type of Service 59  
(43) Structure Type Main 302  
(44) Structure Type Approach 000  
(45) No of Span Main 001  
(46) No of Approach Spans 0000  
(27) Year Built 1960  
(106) Year Reconstructed 0000  
(107) Deck Str Type 1  
(108) Wear Surf/Protv Sys 100  
(111) Nav Pier/Abut Protection

Appraisal Rating

(67) Structure Evaluation 6  
(68) Deck Geometry 5  
(69) Underclrn Vert & Horz N  
(71) Waterway Adequacy 8  
(72) Approach Rdwy Alignment 7  
(36) Traffic Safety Features 1NNN  
(113) Scour Critical Bridges 8

Load Rate and Post

(41) Str Open/Post/Close Open  
(64) Operating Rating 55.3 ton  
(66) Inventory Rating 29.9 ton  
(70) Bridge Posting 5

Over 200 Items

(200) COE MSC CENAD  
(201) COE District CENAE  
(202) Structure Number CEPNEDCT0910002  
(203) Inspection Office EPDG  
(204) Inspector JOE COLUCCI  
(205) Inspection Cost 009000  
(206) Cooper's Loading  
(207) Railroad Stru Number  
(208) Name of Railroad  
(209) Recommended Speed Limit  
(210) Posted Speed Limit (KPH)  
(211) MACOM  
(212) Installation Name  
(213) Military Wheel Load Class  
(214) Military Truck Load Class  
(215) Installation Number  
(216) Seismic Category  
(217) Acceleration Coefficient 0.00  
(218) Soil Site Coefficient 0.0

Sufficiency Rating = 092.3



Photo 1: Areas of deteriorated concrete at the east abutment backwall. *Note: the missing paint at the deck joint.*

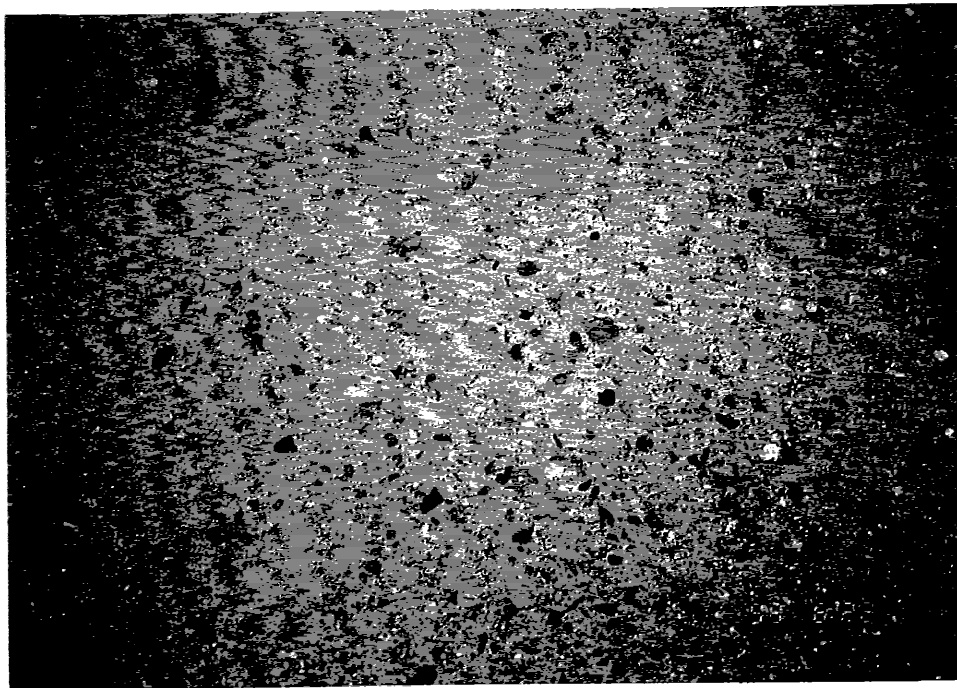


Photo 2: Moderate abrasion of the bridge deck surface. *Note: several concrete patches on the deck.*

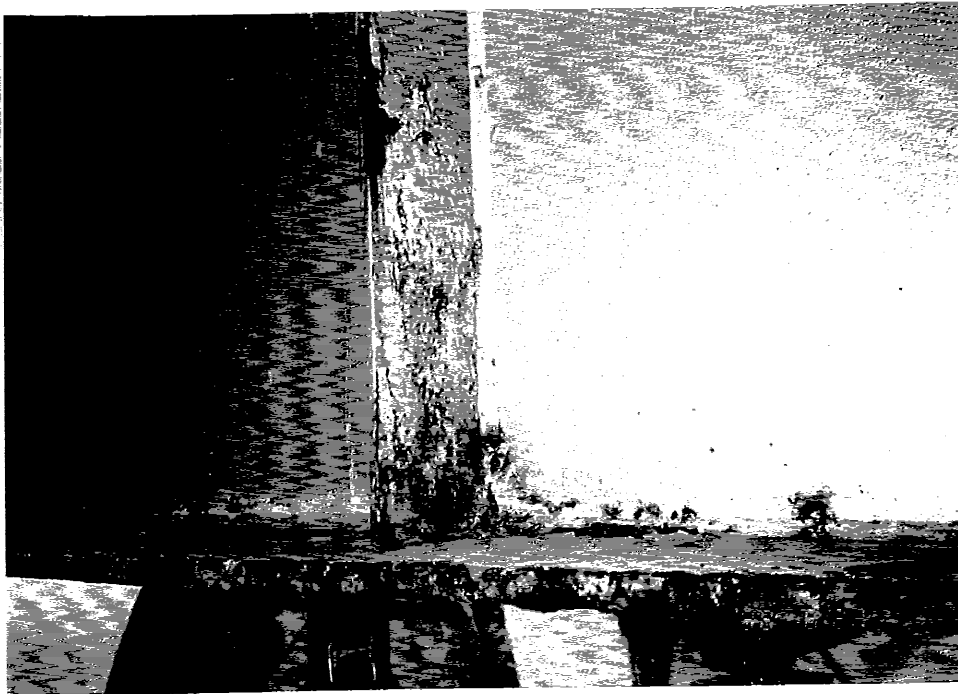


Photo 3: Typical moderate to severe corrosion and section loss of the bottom flange of girder 1 at the first three sections (between diaphragms) adjacent to the bridge seat.

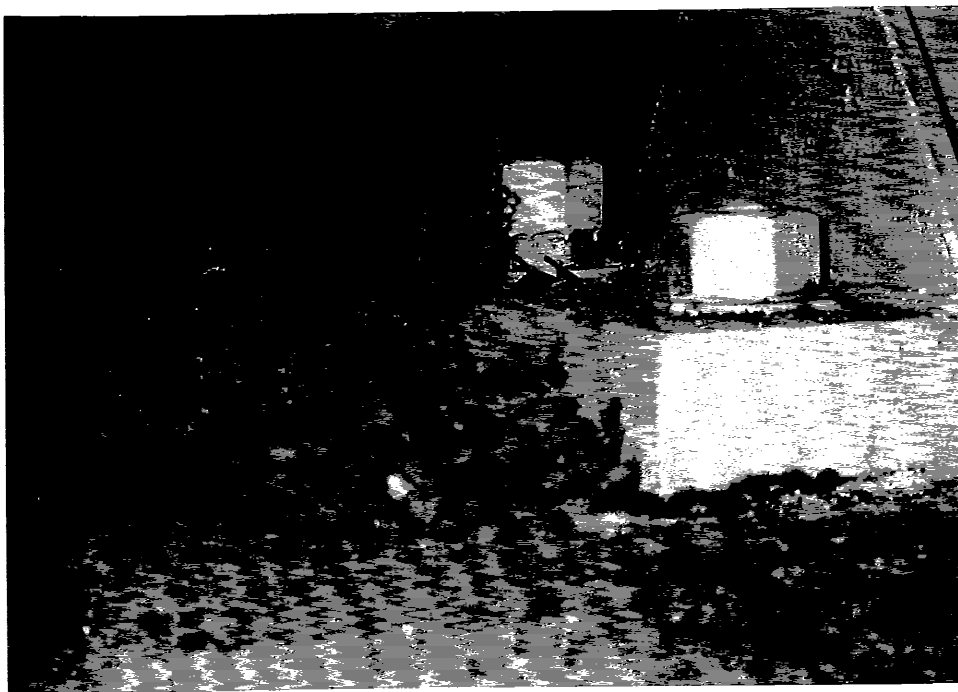


Photo 4: A loose nut at the fixed bearing at girder 3. Note: minor rusting of the bearing and vegetation growth.

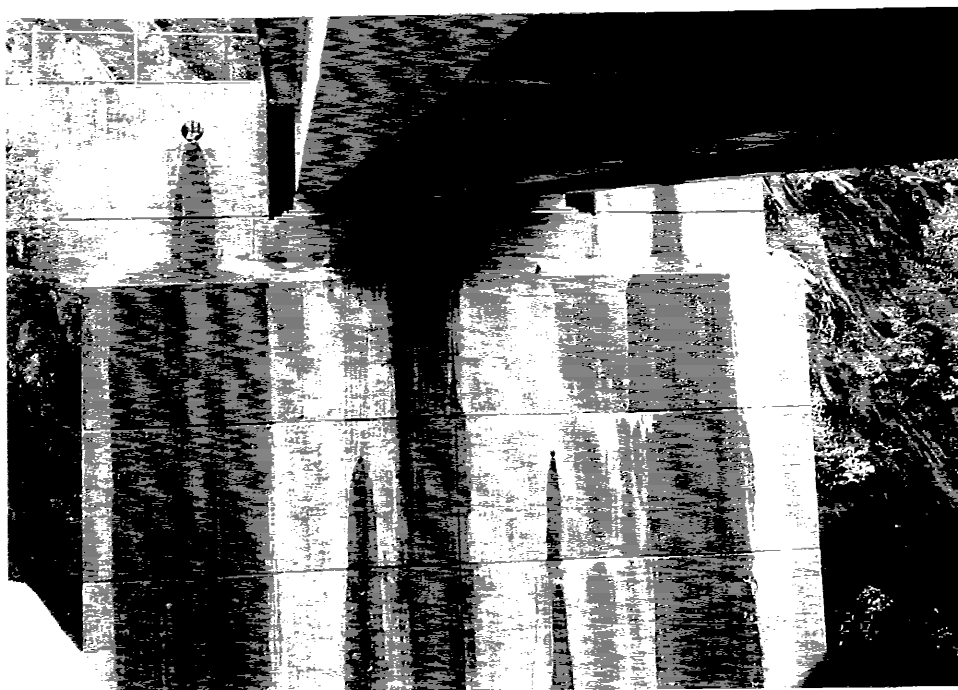


Photo 5: Elevation of the east abutment. *Note: the seepage from the drains on either side of the bridge and the PVC drain.*

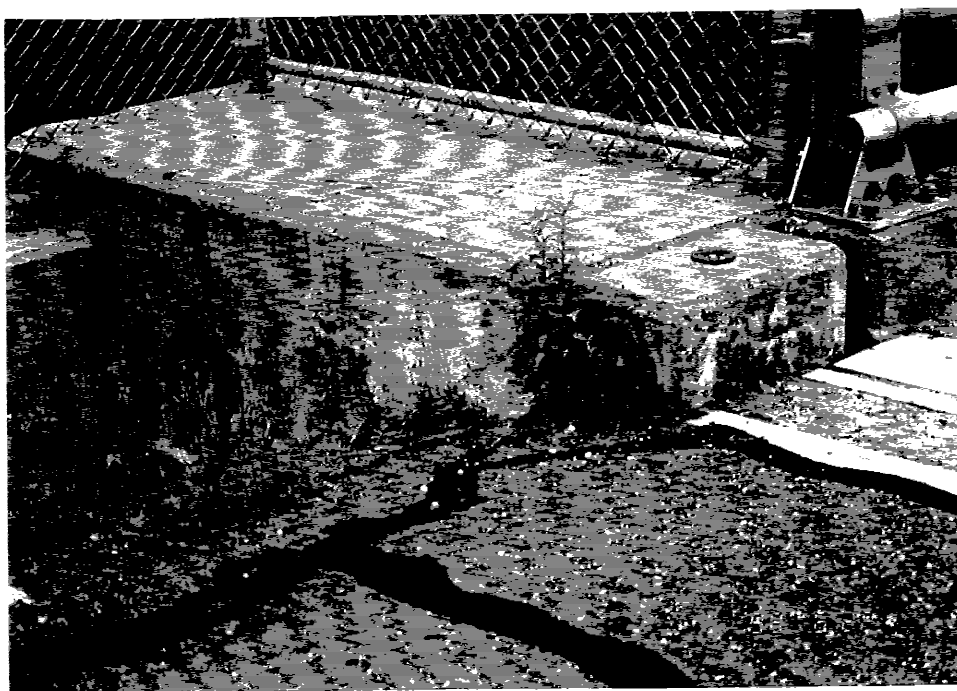


Photo 6: Cracks with efflorescence on the backside of the exposed south backwall adjacent to the drain and the east approach.

LITTLEVILLE DAM  
SPILLWAY BRIDGE  
HUNTINGTON, MASSACHUSETTS  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

23 June 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection,	27	Aug	96
Routine Inspection,	23	Aug	94
Routine Inspection,	6	Aug	92
Routine Inspection,	28	Aug	90
Routine Inspection,	25	Aug	88
Inventory Inspection,	17	May	84

BRIDGE DESCRIPTION AND HISTORY

The spillway bridge at Littleville Dam (originally constructed in 1964) is a single span, welded plate girder bridge. It has a span length of 117'-6" center to center of bearings. The roadway width is 20'-0" between curbs. The 1'-1" wide x 10" high concrete curbs support 3'-0" high aluminum bridge rails.

The composite reinforced concrete deck slab which varies in thickness from 8" at the gutters to 10 1/2" at the centerline is supported by three welded plate girders. The plate girders consist of 84" deep webs spaced at 8'-6" center to center. Cross bracing is located at spacings varying from 16'-2" to 17'-8" and the bottom flanges are all laterally braced. All cross bracing and lateral bracing connections are welded. There are four utility ducts supported by hangars on the underside of the deck. Both abutments are stub type and were placed monolithically with the respective spillway walls.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	29T	53T	No change in rating.
3	45T	83T	
3S2	53T	96T	
3-3	57T	104T	



EVALUATION (See attached "Structures Inspection Field Report")

A. Approach Roadway

Both the east and west approach roadways are in good condition. Approach alignment is good at both approaches. There is a 1" gap at the joint between the bituminous pavement and backwall at the east approach. There is a 1" depression at the bituminous pavement and the backwall transition at the west approach, and vegetation is growing in the joint. There are no load rating signs posted at either approach. There is a speed limit posting of 15 mph at the east approach roadway. The concrete posts and steel cable approach guardrail are in good condition.

B. Deck

The overall condition of the bridge deck is good. There is minor abrasion of the deck surface and curbs. The bridge guardrails are in good condition. The scuppers are clear and in good condition. The sealant at the deck joints is deteriorated and cracked. A 16" section of the sealant is missing at the east joint. Paint at joint plates is worn.

C. Superstructure

The steel superstructure is in overall good condition. All three girders are in good condition with minor scattered rust spots. Most of the welded connections are in good condition, with no signs of cracks in the steel. However, there are several welds at secondary members which exhibit surface discontinuities such as indentations and bulges. Orange primer is visible at the end of girder 3 at the west abutment where painting was not completed. There is minor to moderate corrosion and section loss at the masonry plates at all three bearings at the east and west abutments. There is a loose bolt nut at the bearing of girder 2 (numbered north to south) of the east abutment.

Clearance between the girder bottom flange and the backwall at the east abutment measure as follows:

Girder 1 (numbered north to south)	= 3"
Girder 2	= 3 <sup>7</sup> / <sub>8</sub> "
Girder 3	= 3 <sup>1</sup> / <sub>4</sub> "

Clearance between the girder bottom flange and the backwall at the west abutment measure as follows:

Girder 1 (numbered north to south)	= <sup>3</sup> / <sub>8</sub> "
Girder 2	= <sup>1</sup> / <sub>2</sub> "
Girder 3	= <sup>3</sup> / <sub>4</sub> "

#### D. Substructure

Both the east and west abutments are in generally good condition. There is a  $\frac{5}{8}$ " crack at the south end of the east abutment backwall where the guardrail and fenceposts are located. This crack extends fully across the top and down the side of the wall. There is also a hairline crack located 2" from the backwall at this southeast abutment. At the southwest abutment, there is a  $\frac{1}{8}$ " up to  $\frac{1}{4}$ " wide crack which starts at the corner of the backwall and extends to the side of the wall. At the northwest abutment, there is a  $\frac{1}{8}$ " to  $\frac{3}{16}$ " wide crack located 2" from the backwall which extends to the fencepost.

There is insufficient clearance between the bridge deck and the backwall at the east abutment. This has caused sections of the underside of the deck to spall off. This has occurred behind girder 1 and the width of the deck between girders 2 and 3. Spall debris was noted on the bridge seat. Numerous hairline horizontal cracks with efflorescence run across the full length of the backwall between girders 1 and 3 at the conduit level. Water has pooled on half of the bridge seat at the north end. It appeared that the water had seeped through the deck joint and the utility conduits. The underside of the joint plate is severely rusted and has stained the backwall. The utility conduits are in good condition. There is efflorescence at the monolith joints at the east abutment breastwall, and there is vegetation growing from the weepholes.

The  $\frac{1}{8}$ " full length horizontal crack filled with sealant noted previously at the backwall of the west abutment has not deteriorated further since the last inspection. There is a full height vertical hairline crack located between girders 1 and 2. The utility conduits are in good condition with minor efflorescence leaching beneath the southernmost conduit. There is minor rust staining of the backwall due to the joint plates. The breastwall has minor efflorescence and hairline cracking. The weepholes were functioning during the inspection.

#### E. Channel

The spillway channel is generally dry. The channel orientation is very good.

## CONDITION RATING

Routine, 1998	7
Routine, 1996	7
Routine, 1994	7
Routine, 1992	7
Routine, 1990	7
Routine, 1988	7
Inventory, 1984	7

## RECOMMENDATIONS

### A. Status of Previous Recommendations

Clean and patch abutment backwalls and seal cracks in backwalls and wingwalls. Clean and seal the entire deck. Clean and paint expansion dams and bearings. Saw cut expansion end of concrete deck and redetail expansion dam plates to allow clearance for thermal expansion.

Estimated Cost: \$50,000

Not Completed.

### B. Revised Recommendations

Perform previous recommendations.

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>HUNTINGTON, MA</b>		bridge dept. no. _____		8-structure no. <b>CEPNEDMA2510018</b>		90-date inspected <b>23 JUNE 1998</b>	
2	104-highway system <b>Ø - NOT ON NHS</b>	22-owner <b>ARMY CORPS OF ENGINEERS</b>	27-year built <b>1964</b>	106-year rebuilt _____	11-milepoint _____		
43-structure type <b>302 - SINGLE SPAN, STEEL PLATE GIRDER</b>				quality control engineer <b>NICK FORBES</b>			
07-facility carried <b>ACCESS ROAD</b>				team leader <b>JOE COLUCCI</b>			
06-features intersected <b>SPILLWAY CHANNEL</b>				team members <b>JENNIFER LEE ; ED MILLS</b>			

<p>item 58 <span style="float: right;"><b>7</b></span></p> <p>DECK</p> <ul style="list-style-type: none"> <li>1. Wearing Surface <span style="float: right;"><b>7</b></span></li> <li>2. Deck-Condition <span style="float: right;"><b>7</b></span></li> <li>3. Stay in Place Forms <span style="float: right;"><b>NA</b></span></li> <li>4. Curbs <span style="float: right;"><b>7</b></span></li> <li>5. Median <span style="float: right;"><b>NA</b></span></li> <li>6. Sidewalks <span style="float: right;"><b>NA</b></span></li> <li>7. Parapet <span style="float: right;"><b>NA</b></span></li> <li>8. Railing <span style="float: right;"><b>8</b></span></li> <li>9. Anti Missile Fence <span style="float: right;"><b>NA</b></span></li> <li>Drains <span style="float: right;"><b>8</b></span></li> <li>Lighting Standards <span style="float: right;"><b>NA</b></span></li> <li>12. Utilities <span style="float: right;"><b>7</b></span></li> <li>13. Deck Joints <span style="float: right;"><b>6</b></span></li> <li>14. Approach Settlement <span style="float: right;"><b>6</b></span></li> </ul>	<p>item 59 <span style="float: right;"><b>7</b></span></p> <p>SUPERSTRUCTURE</p> <ul style="list-style-type: none"> <li>1. Bearing Devices <span style="float: right;"><b>7</b></span></li> <li>2. Stringers <span style="float: right;"><b>NA</b></span></li> <li>3. Diaphragms <span style="float: right;"><b>7</b></span></li> <li>4. Girders or Beams <span style="float: right;"><b>7</b></span></li> <li>5. Floor Beams <span style="float: right;"><b>NA</b></span></li> <li>6. Trusses <span style="float: right;"><b>NA</b></span></li> <li>7. Rivets or Bolts <span style="float: right;"><b>8</b></span></li> <li>8. Welds <span style="float: right;"><b>8</b></span></li> <li>9. Collision Damage <span style="float: right;"><b>8</b></span></li> <li>10. Load Deflection <span style="float: right;"><b>8</b></span></li> <li>11. Member Alignment <span style="float: right;"><b>8</b></span></li> <li>12. Load Vibration <span style="float: right;"><b>8</b></span></li> <li>13. Paint-Epoxy <span style="float: right;"><b>7</b></span></li> <li>14. Year Painted <span style="float: right;"><b> </b></span></li> <li>15. Under Clearance <b>NA</b> ft <b> </b> in</li> <li>Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no</li> </ul>	<p>item 60 <span style="float: right;"><b>7</b></span></p> <p>SUBSTRUCTURE</p> <ul style="list-style-type: none"> <li>1. Abutments <ul style="list-style-type: none"> <li>a-Wings <span style="float: right;"><b>NA</b></span></li> <li>b-Backwall <span style="float: right;"><b>5</b></span></li> <li>c-Bridge Seats <span style="float: right;"><b>7</b></span></li> <li>d-Breastwall <span style="float: right;"><b>7</b></span></li> <li>e-Footings <span style="float: right;"><b>NA</b></span></li> <li>f-Piles <span style="float: right;"><b>NA</b></span></li> <li>g-Erosion <span style="float: right;"><b>8</b></span></li> <li>h-Settlement <span style="float: right;"><b>8</b></span></li> </ul> </li> <li>2. Piers or Bents <ul style="list-style-type: none"> <li>a-Caps <span style="float: right;"><b>NA</b></span></li> <li>b-Column <span style="float: right;"><b>NA</b></span></li> <li>c-Web <span style="float: right;"><b>NA</b></span></li> <li>d-Footing <span style="float: right;"><b>NA</b></span></li> <li>e-Piles <span style="float: right;"><b>NA</b></span></li> <li>f-Scour <span style="float: right;"><b>NA</b></span></li> <li>g-Settlement <span style="float: right;"><b>NA</b></span></li> </ul> </li> <li>3. Collision Damage <span style="float: right;"><b>8</b></span></li> <li>4. Hydraulic-Adequacy <span style="float: right;"><b>8</b></span></li> </ul>
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<p>Actual Posting      H   3   3S2      Single</p> <p style="text-align: center;"><b>NA</b> <b>NA</b> <b>NA</b>      <b> </b></p> <p>Recommended Posting      From Rating Book      <b>29</b> <b>45</b> <b>53</b>      <b> </b></p> <p>SIGNS IN PLACE      at bridge      advance</p> <p>Y or N      <b>NA</b>      <b>NA</b></p> <p>LEGIBILITY      <b> </b>      <b> </b></p>	<p>Overhead Signs (attached to bridge)</p> <p><input type="checkbox"/> yes      <input checked="" type="checkbox"/> no</p> <div style="margin-top: 20px;"> <p>1. Welds <span style="float: right;"><b> </b></span></p> <p>2. Bolts <span style="float: right;"><b> </b></span></p> <p>3. Condition <span style="float: right;"><b> </b></span></p> </div> <p>Item 93b    U/W Inspection Date: <b>NA</b></p>
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<p>ITEM 61-channel and channel protection <span style="float: right;"><b>8</b></span></p> <ul style="list-style-type: none"> <li>1. channel scour <span style="float: right;"><b>8</b></span></li> <li>2. embankment erosion <span style="float: right;"><b>8</b></span></li> <li>under system <span style="float: right;"><b>NA</b></span></li> <li>our dikes &amp; jetties <span style="float: right;"><b>NA</b></span></li> <li>5. rip rap or slope paving <span style="float: right;"><b>NA</b></span></li> <li>6. effectiveness <span style="float: right;"><b>8</b></span></li> <li>7. debris <span style="float: right;"><b>8</b></span></li> <li>8. vegetation <span style="float: right;"><b>8</b></span></li> </ul>	<p>36-Traffic Safety features</p> <table style="width: 100%;"> <tr> <td>36</td> <td>condition</td> </tr> <tr> <td>1. bridge railing <span style="float: right;"><b>1</b></span></td> <td><span style="float: right;"><b>8</b></span></td> </tr> <tr> <td>2. transitions <span style="float: right;"><b>NA</b></span></td> <td><span style="float: right;"><b>8</b></span></td> </tr> <tr> <td>3. approach guardrail <span style="float: right;"><b>NA</b></span></td> <td><span style="float: right;"><b>8</b></span></td> </tr> <tr> <td>4. guardrail terminal <span style="float: right;"><b>NA</b></span></td> <td><span style="float: right;"><b> </b></span></td> </tr> </table>	36	condition	1. bridge railing <span style="float: right;"><b>1</b></span>	<span style="float: right;"><b>8</b></span>	2. transitions <span style="float: right;"><b>NA</b></span>	<span style="float: right;"><b>8</b></span>	3. approach guardrail <span style="float: right;"><b>NA</b></span>	<span style="float: right;"><b>8</b></span>	4. guardrail terminal <span style="float: right;"><b>NA</b></span>	<span style="float: right;"><b> </b></span>
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**X=UNKNOWN      NA=NOT APPLICABLE      IA=INACCESSIBLE**

## NBI Metric Structural Inventory and Appraisal

Date Printed: 09/01/98

(202) Corps of Engineers Structure Number: CEPNEDMA2510018

(8) NBI Structure Number: CEPNEDMA2510018

## Geographic and Route Data

## Dimensional Data

## Inspection Data

(1) State	Massachusetts	(32) Approach Rdwy Width	6.1 M	(90) Inspection Date (MoYr)	0698
(2) District	03	(39) Navigation Vert Clr	0.0 M	(91) Inspection Frequency	24 Mo
(3) County	015	(40) Navigation Horz Clr	0.0 M	(92) Critical Feature Insp	(93) Date
(4) Place	31750	(48) Max Span Length	0035.8 M	Frac Crit Insp : N	00 /
(6) Feature Under	SPILLWAY CHANNEL	(49) Str Length	00036.3 M	Underwater Insp: N	00 /
(7) Facility on	ACCESS RD	(50) Curb/Sidewalk Width	Left 00.3 M	Other Spec Insp: N	00 /
(9) Location	1.61 KM NW MA RTE 112		Right 00.3 M		
(16) Latitude	42° 16' 00.00"	(51) Brg Rdwy Width, curb-curb	006.1 M		
(17) Longitude	072° 53' 00.00"	(52) Deck Width out-out	006.8 M		
(98) Border Bridge		(53) Min Vert Clr over	99.99 M		
(99) Border Bridge Str No		(54) Min Vert Clr under	N 00.00 M		
(103) Temporary Str		(55) Min Lat Underclr R	N 00.0 M		
		(56) Min Lat Underclr L	99.9 M		

## On and Under Record Data

(112) NBIS Bridge Length	Y
(116) Navigation Min Vert Clr	0.0 M

(5) Inventory Route	Route On	168000000
(10) Min Vert Clr	99.99 M	
(11) Kilometer Point	0000.000	
(19) Detour Length	199 km	
(20) Toll	3	
(26) Func Class	09	
(28) Lanes on/under	0200	
(29) ADT	10	
(30) Year of ADT	1998	
(47) Total Horz Clearance	06.1 M	
(100) Defense Hwy	0	
(101) Parallel Str	N	
(102) Direction of Traffic	2	
(104) Hwy System	0	
(109) Truck Traffic	05%	
(110) Natl Truck Network	No	

## Proposed Improvements

(75) Type of Work	351
(76) Improvement Length	000363 M
(94) Bridge Improv Cost	50
(95) Rdwy Improv Cost	0
(96) Total Proj Cost	50
(97) Year of Cost Est	1996
(114) Future ADT	10
(115) Year of Future ADT	2015

## Condition Rating

(58) Deck	7
(59) Superstructure	7
(60) Substructure	7
(61) Channel & Channel Protect	8
(62) Culverts	N

## General Data

## Appraisal Rating

(21) Maintenance Responsibility	70	(67) Structure Evaluation	6
(22) Owner	70	(68) Deck Geometry	5
(31) Design Load	2	(69) Underclrn Vert & Horz	N
(33) Bridge Median	0	(71) Waterway Adequacy	8
(34) Skew	00 deg	(72) Approach Rdwy Alignment	7
(35) Str Flared	No	(36) Traffic Safety Features	1NNN
(37) Hist Significance	5	(113) Scour Critical Bridges	8
(38) Navigation Control	N		
(42) Type of Service	59		
(43) Structure Type Main	302		
(44) Structure Type Approach	000		
(45) No of Span Main	001		
(46) No of Approach Spans	0000		
(27) Year Built	1964		
(106) Year Reconstructed	0000		
(107) Deck Str Type	1		
(108) Wear Surf/Protv Sys	000		
(111) Nav Pier/Abut Protection			

## Load Rate and Post

(41) Str Open/Post/Close	Open
(64) Operating Rating	48.1 ton
(66) Inventory Rating	26.3 ton
(70) Bridge Posting	5

Sufficiency Rating = 089.0

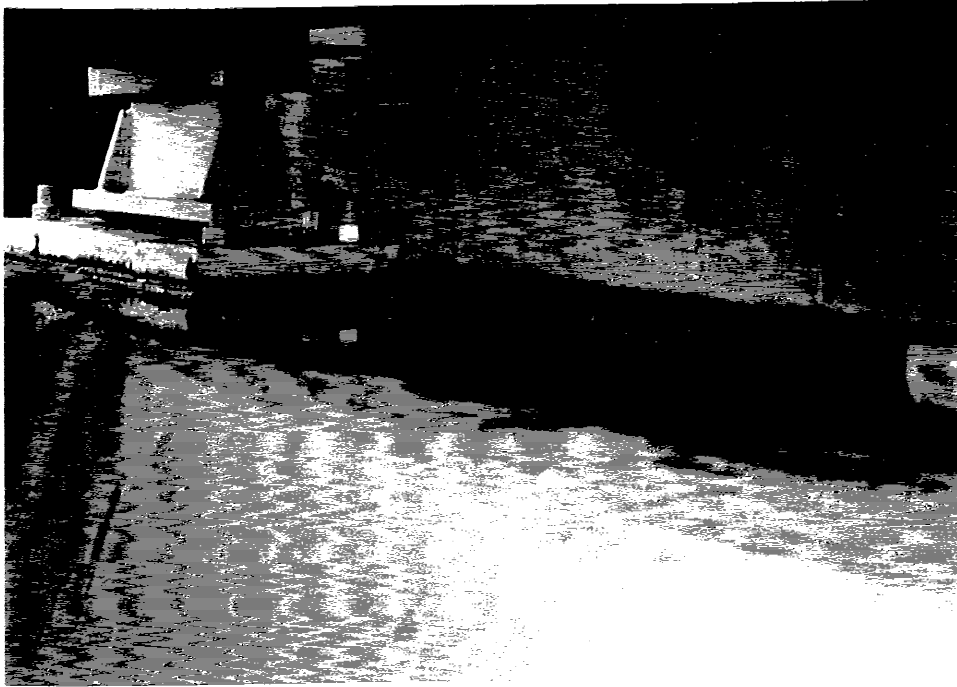


Photo 1: Typical minor corrosion and section loss at the masonry plate of girder 1 at the east abutment. *Note water ponding at the bridge seat.*

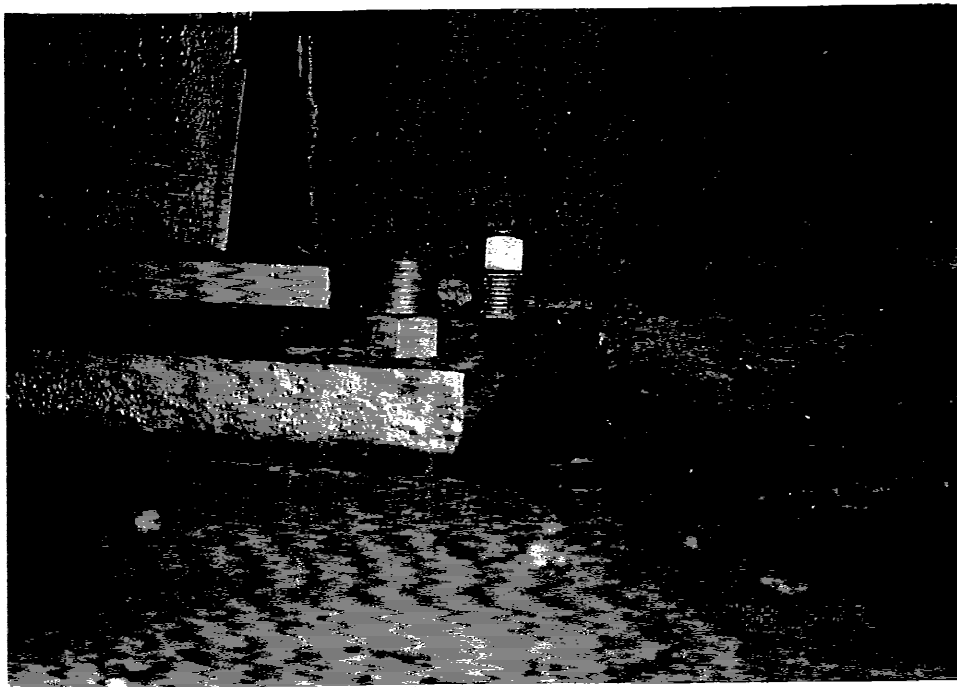


Photo 2: A loose anchor bolt nut at the bearing of girder 2 at the east abutment.

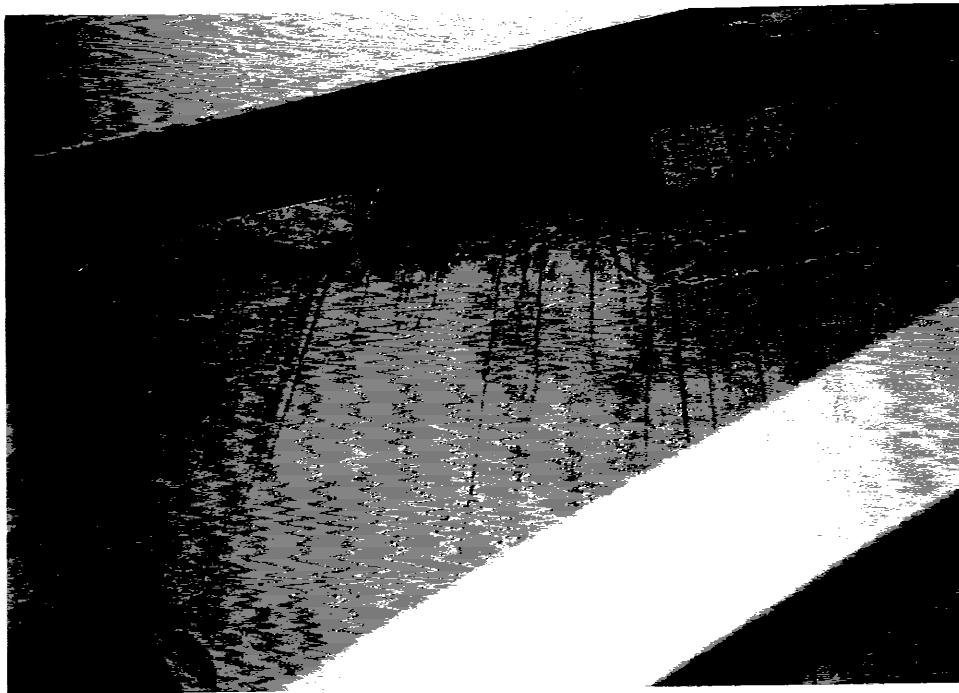


Photo 3: Spalling of the underside of the bridge deck due to insufficient clearance between the deck and the backwall at the east abutment. *Note the joint plate is severely rusted and is staining the backwall.*

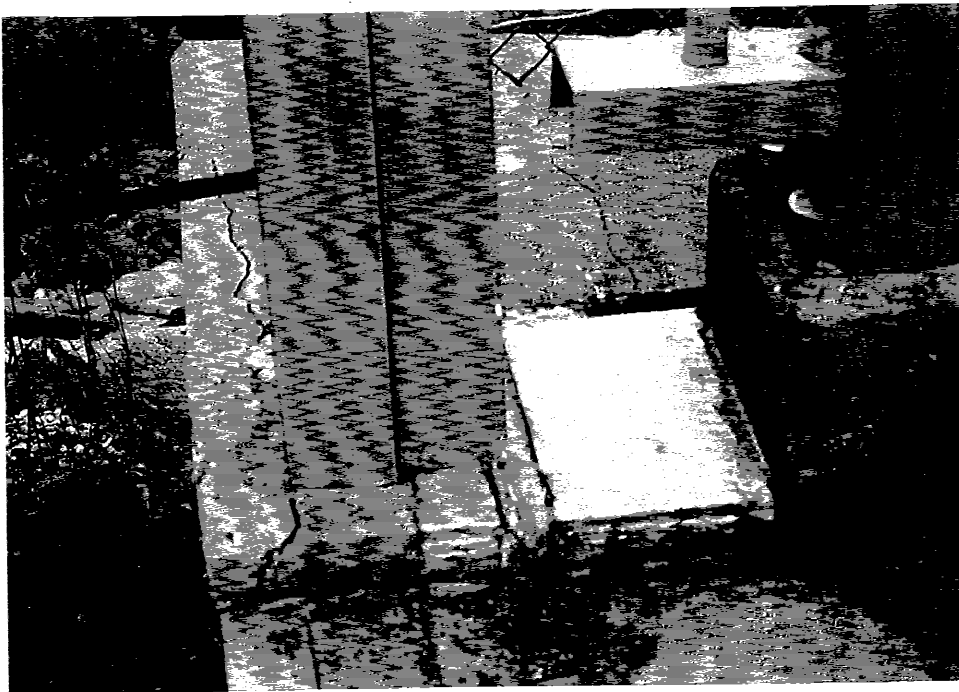


Photo 4: A  $\frac{5}{8}$ " crack at the south end of the east abutment backwall where the guardrail and the fenceposts are located and also a hairline crack located 2" from the backwall

WEST THOMPSON LAKE  
SPILLWAY BRIDGE  
NORTH GROSVENORDALE, CT  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

24 June 1998

DATES OF PREVIOUS INSPECTIONS

Routine, 28 Aug. 96  
Routine, 26 Aug. 94  
Routine, 04 Aug. 92  
Routine, 27 Aug. 90

BRIDGE DESCRIPTION AND HISTORY

The spillway Bridge at West Thompson Lake is a single span, welded plate girder structure constructed in 1965. The structure is 114'-0" long, center to center of end bearing plates. Roadway width is 39'-0" between curbs, with a 2'-7" wide concrete safety walk on both sides. The bridge railing consists of a two-pipe aluminum rail with 16" high aluminum posts supported on 1'-3" wide by 2'-0" high concrete parapets. The bridge is on a 28 degree right forward skew. There is a timber post and cable guard rail system on the east approach, and a standard steel post and guard rail system on the west approach. A 9" thick composite reinforced concrete deck is supported by five 72" deep welded plate girders spaced at 8'-0" on centers. Cross frames are spaced at 17'-0" and lateral bracing is used in the two outside bays only. There are two utility ducts supported by the bottom chord of the cross frame in the northern-most bay. There are four scuppers located on the bridge to provide drainage. The abutments are stub type (concrete cap and back wall) placed on top of the rock spillway channel walls, with a concrete facing wall extending down from the abutment cap to the bottom of the spillway channel.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	32T	60T	No change in ratings due to inspection findings.
3	49T	93T	
3S2	57T	108T	
3-3	62T	116T	



EVALUATION (See attached "Structures Field Inspection Report")

A. Approach Roadway

The pavement is in adequate condition with slightly uneven wearing surfaces where both approaches meet the concrete deck. The timber post and cable approach guard rail at the south east approach is not tied to the parapet. There is no guard rail at the northeast corner of the bridge because a turn-off area for parking is located just east of the bridge. The steel guard rails on the west approach transition properly to the deck guard rail. Posting at, or approaching, the bridge is not required.

B. Deck

The overall condition of the deck is fair with a noticeable increase in deterioration of the wearing surface compared with the FY94 inspection (first noted in 1996). The deck, curbs and parapets show moderate abrasion with exposed aggregate surface. However, three major areas of deteriorated concrete exist on the deck surface. The first area is at the middle of the deck slightly towards the east end where a 6" diameter hole has formed; unsound, delaminated concrete exists all around this hole. The other two areas are located on the north side of the bridge, one at each end. Although no spalling or pop-outs can be observed in these two locations, significant hollow, unsound concrete was noted around these two areas.

Deck scuppers are unclogged, and appear to be functioning properly. Minor rusting was noted at the steel expansion dams at both ends of the bridge. The aluminum guard rail and concrete parapet are both in good condition. On the underside of the deck, there are dark stains, probably salt staining, in the area of the spalled concrete above. There are transverse horizontal, hairline cracks with visible efflorescence in several locations on the deck underside; these all occur at the third points in the deck span. There is also a 1' length of exposed rebar on the underside of the deck near Girder #1 (Girders are numbered from north to south).

### C. Superstructure

The overall condition of the structural steel and bearings is good. The steel was last painted in 1988. There is minor to moderate rusting of the five main girder webs, tension (bottom) flanges and diaphragms. All welds appear adequate. All fixed bearings (west abutment) and expansion bearings (east abutment) appear to be in good condition. Minor rusting of base plates and anchor bolts were noted. Clearance between ends of girders at both fixed (west) and expansion (east) ends are adequate. Girder clearances at the east end range from 3 1/2" to 5 1/2"; at the west end from 4 to 4 1/4".

### D. Substructure

The overall condition of the abutments is good. Efflorescence at several horizontal construction joints and weepholes were noted at both east and west abutment walls. Hairline vertical cracks, full-length, were noted on the east abutment back wall (between Girders #1 and #2), and on the west abutment back wall (between Girders #2 and #3, and between Girders #4 and #5). Cracks have not changed since the previous inspection, are not structural cracks, and are not considered to be significant.

On both abutments, the bridge seats and the bearings are completely covered with bird guano. Although this is not a significant structural issue, during future inspections respirators should be used to avoid inhalation of the guano dust.

### E. Channel

The spillway channel alignment is good on both upstream and downstream sides of the bridge. Minor amounts of debris and some vegetative growth were noted in the channel. The channel remains wet most of the year and access to the channel is quite difficult.

<u>CONDITION RATING</u>	Routine, 1998	6
	Routine, 1996	6
	Routine, 1994	7
	Routine, 1992	7
	Routine, 1990	7
	Inventory, 1984	6/7

## RECOMMENDATIONS

### STATUS OF PREVIOUS RECOMMENDATIONS

1. Remove areas of deteriorated concrete (most likely 1 - 1 1/2 inch depth, minimum) over entire surface of deck; apply a regular concrete overlay with penetrating sealer, or a latex-modified concrete overlay. Traffic control will be a significant cost since the structure is located on a major road.

Estimated Cost: \$60,000.

2. Clean and paint the structural steel and bearings within the next five years. (Note: The structure was originally painted with lead paint which has not been abated)

Estimated Cost: \$225,000.

Note: These recommendations have not yet been completed; however, FY 99 funds have been budgeted to perform the design and complete the work.

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>NORTH GROSVENORDALE, CT.</b>		bridge dept. no.		8-structure no. <b>CEPNED CT0910001</b>		90-date inspected <b>6/24/98</b>	
it.	104-highway system <b>S NON-FEDERAL AID</b>	22-owner <b>COPE</b>	27-year built <b>1965</b>	106-year rebuilt <b>-</b>	11-milepoint		
43-structure type <b>403 STEEL PLATE GIRDER</b>				quality control engineer <b>NICK FORBES</b>			
07-facility carried <b>WEST THOMPSON ROAD</b>				team leader <b>JOE COLUCCI</b>			
06-features intersected <b>WEST THOMPSON SPILLWAY CHANNEL</b>				team members <b>JOE COLUCCI, FRANCIS FUNG</b>			

<b>item 58</b> <span style="float: right; border: 1px solid black; padding: 2px;">7</span> <b>DECK</b> 1. Wearing Surface <span style="float: right; border: 1px solid black; padding: 2px;">6</span> 2. Deck-Condition <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 3. Stay in Place Forms <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 4. Curbs <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 5. Median <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 6. Sidewalks <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 7. Parapet <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 8. Railing <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 9. Anti Missile Fence <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 10. Drains <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 11. Lighting Standards <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 12. Utilities <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 13. Deck Joints <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 14. Approach Settlement <span style="float: right; border: 1px solid black; padding: 2px;">7</span>	<b>item 59</b> <span style="float: right; border: 1px solid black; padding: 2px;">7</span> <b>SUPERSTRUCTURE</b> 1. Bearing Devices <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 2. Stringers <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 3. Diaphragms <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 4. Girders or Beams <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 5. Floor Beams <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 6. Trusses <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 7. Rivets or Bolts <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 8. Welds <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 9. Collision Damage <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 10. Load Deflection <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 11. Member Alignment <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 12. Load Vibration <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 13. Paint-Epoxy <span style="float: right; border: 1px solid black; padding: 2px;">6</span> 14. Year Painted <b>1988</b> <span style="float: right; border: 1px solid black; padding: 2px;">6</span> 15. Under Clearance _____ ft _____ in Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<b>item 60</b> <span style="float: right; border: 1px solid black; padding: 2px;">7</span> <b>SUBSTRUCTURE</b> 1. Abutments a-Wings <span style="float: right; border: 1px solid black; padding: 2px;">7</span> b-Backwall <span style="float: right; border: 1px solid black; padding: 2px;">7</span> c-Bridge Seats <span style="float: right; border: 1px solid black; padding: 2px;">7</span> d-Breastwall <span style="float: right; border: 1px solid black; padding: 2px;">7</span> e-Footings <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> f-Piles <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> g-Erosion <span style="float: right; border: 1px solid black; padding: 2px;">8</span> h-Settlement <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 2. Piers or Bents a-Caps <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> b-Column <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> c-Web <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> d-Footing <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> e-Files <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> f-Scour <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> g-Settlement <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 3. Collision Damage <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 4. Hydraulic-Adequacy <span style="float: right; border: 1px solid black; padding: 2px;">8</span>
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Actual Posting <div style="display: flex; justify-content: space-around;"> <span>H</span><span>3</span><span>3S2</span> </div> <div style="display: flex; justify-content: space-around;"> <span style="border: 1px solid black; padding: 2px;">-</span> <span style="border: 1px solid black; padding: 2px;">-</span> <span style="border: 1px solid black; padding: 2px;">-</span> </div>	Single <div style="border: 1px solid black; padding: 2px; width: 30px; margin: 0 auto;">-</div>	Overhead Signs (attached to bridge) <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Recommended Posting From Rating Book <div style="display: flex; justify-content: space-around;"> <span style="border: 1px solid black; padding: 2px;">-</span> <span style="border: 1px solid black; padding: 2px;">-</span> <span style="border: 1px solid black; padding: 2px;">-</span> </div>	<div style="border: 1px solid black; padding: 2px; width: 30px; margin: 0 auto;">-</div>	1. Welds <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 2. Bolts <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 3. Condition <span style="float: right; border: 1px solid black; padding: 2px;">NA</span>
SIGNS IN PLACE Y or N <div style="display: flex; justify-content: space-around;"> <span>at bridge</span> <span>advance</span> </div> <div style="display: flex; justify-content: space-around;"> <span style="border: 1px solid black; padding: 2px;">N</span> <span style="border: 1px solid black; padding: 2px;">N</span> </div>		
LEGIBILITY <div style="border: 1px solid black; padding: 2px; width: 30px; margin: 0 auto;">-</div>	<div style="border: 1px solid black; padding: 2px; width: 30px; margin: 0 auto;">-</div>	

<b>ITEM 61-channel and channel protection</b> <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 1. channel scour <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 2. embankment erosion <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 3. fender system <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 4. spur dikes & jetties <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 5. rip rap or slope paving <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 6. effectiveness <span style="float: right; border: 1px solid black; padding: 2px;">NA</span> 7. debris <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 8. vegetation <span style="float: right; border: 1px solid black; padding: 2px;">7</span>	<b>36-Traffic Safety features</b> <div style="display: flex; justify-content: space-between;"> <div>           1. bridge railing <span style="float: right; border: 1px solid black; padding: 2px;">/</span>            2. transitions <span style="float: right; border: 1px solid black; padding: 2px;">/</span>            3. approach guardrail <span style="float: right; border: 1px solid black; padding: 2px;">/</span>            4. guardrail terminal <span style="float: right; border: 1px solid black; padding: 2px;">/</span> </div> <div style="text-align: right;"> <b>36</b>            condition  <span style="border: 1px solid black; padding: 2px;">7</span>  <span style="border: 1px solid black; padding: 2px;">7</span>  <span style="border: 1px solid black; padding: 2px;">7</span>  <span style="border: 1px solid black; padding: 2px;">7</span> </div> </div>
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**X=UNKNOWN**
**NA=NOT APPLICABLE**
**IA=INACCESSIBLE**

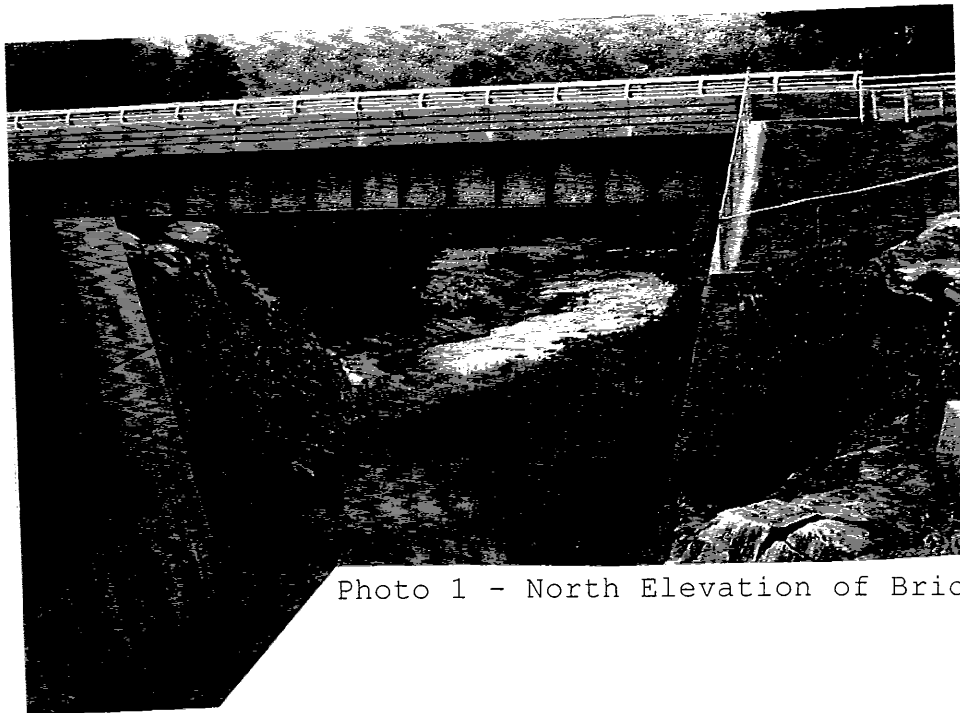


Photo 1 - North Elevation of Bridge

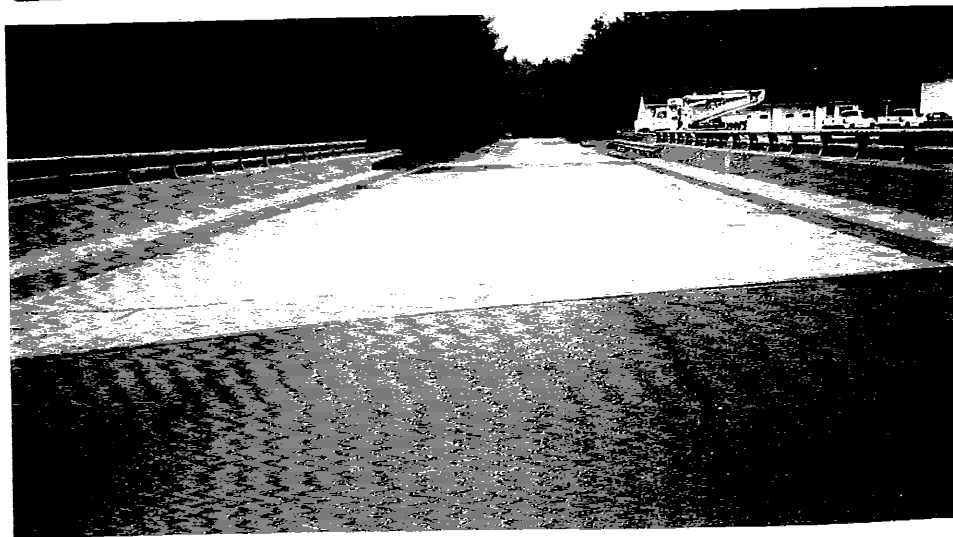
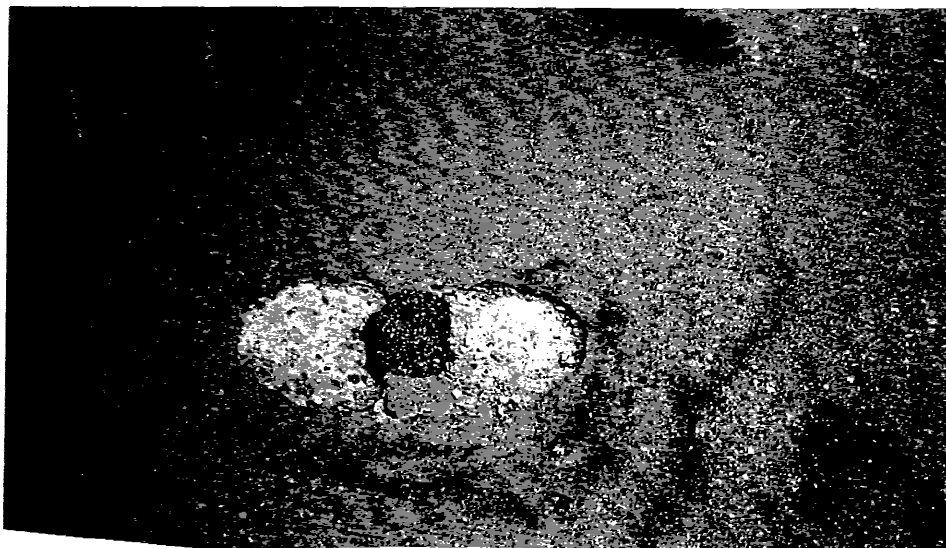


Photo 2 - East Approach (Above)

Photo 3 - Worst area of deteriorated and unsound area of concrete near center of deck (Below)



BARRE FALLS DAM  
SPILLWAY BRIDGE  
BARRE, MA  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION: 24 June 98.

DATE OF PREVIOUS INSPECTION: Routine Inspection, 29 August 96.  
Routine Inspection, 27 August 94.  
Routine Inspection, 30 June 92.  
Routine Inspection, 22 May 90.  
Routine Inspection, 6 June 88.  
Inventory Inspection, 14 May 84.

BRIDGE DESCRIPTION AND HISTORY

The spillway bridge at Barre Falls Dam is a single span, riveted plate girder structure constructed in 1957. Span length is 95'-0" center to center of bearings. Roadway width is 18'-0" between 1'-3" curbs and 3'-0" high steel pipe rails on both sides. The composite concrete deck varies in thickness from 7 1/2" at the curbs to 8 1/2" at the centerline. The deck is supported by two riveted plate girders (72" webs) spaced at 18'-0" on center. Transverse floor beams spaced at 19'-0" on center frame into the girders; two longitudinal stringers (between girders) spaced at 6'-0" on center frame into the floor beams. In 1990, the existing concrete deck was resurfaced with an epoxy resin and sand skid-resistant broadcast overlay. All the connections in the structure are riveted. There are six scuppers on the deck for drainage. Both abutment are concrete gravity structures founded on rock.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	13T	21T	No change in rating due to inspection findings.
Type 3	17T	27T	
Type 3S2	26T	40T	
Type 3-3	30T	53T	

#### D. Substructure

The overall condition is good. Minor surface hairline cracks with slight efflorescence and two horizontal cracks are seen on both abutment back walls. These cracks are minor and too fine to inject. At the east abutment, there is a vertical crack that runs the full height of the spillway training wall; it appears to have been repaired. There is minor efflorescence on the east abutment breast wall. At the west abutment, there are numerous vertical cracks on the spillway training wall and the abutment breast wall. These cracks have been repaired (sealed with an elastomeric sealant) in 1990, but heavy efflorescence has formed around the sealant. At the breast wall, there are signs of seepage and efflorescence and some minor spalls.

#### E. Channel

The spillway channel alignment is good on both the upstream and downstream sides of the bridge. Vegetation is minimal.

#### CONDITION RATING

Routine,	1998	7
Routine,	1996	7
Routine,	1994	7
Routine,	1992	8
Routine,	1990	7
Routine,	1988	7
Inventory,	1984	7

#### RECOMMENDATIONS

##### STATUS OF PREVIOUS RECOMMENDATION:

- Repair deteriorated epoxy at the deck surface. The original epoxy manufacturer has agreed to supply the required materials to perform all necessary repairs. It is currently planned to have an existing contract at the project modified to provide the necessary labor to perform the repairs.

Not done

- Continue to monitor the condition of the raised sliding plates at both expansion dams. Project personnel can adopt for O&M program.

RECOMMENDATIONS (continued)

STATUS OF PREVIOUS RECOMMENDATION:

- Tighten two loose bolts at the south bearing on the east abutment and one loose bolt at the north bearing on the west.

Not done.

REVISED RECOMMENDATIONS:

- (1) Sound epoxy coating over entire deck surface. Remove all loose and unsound areas of epoxy. Patch all areas where epoxy has been removed.

Estimated Cost      \$ 10,000

- (2) Provide an additional coat of epoxy with non-skid material over the entire bridge surface taking particular care to perform the proper surface preparation as specified by materials manufacturer.

Estimated Cost      \$ 15,000

- (3) Repair concrete spalls on bridge deck curb.

Estimated Cost      \$ 5,000

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Total      \$ 30,000



# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>BARRE, MA</b>		bridge dept. no.		8-structure no. <b>CEPNED MA 2510011</b>		90-date inspected <b>6/24/98</b>	
it.	104-highway system <b>8 NON-FED AID</b>	22-owner <b>70 COE</b>	27-year built <b>1957</b>	106-year rebuilt <b>NA</b>	11-milepoint		
43-structure type <b>302 RIVETED PLATE GIRDER</b>				quality control engineer <b>NICK FORBES</b>			
07-facility carried <b>Access Road</b>				team leader <b>Joseph Colucci</b>			
06-features intersected				team members <b>Francis Pung &amp; J. Colucci</b>			

<b>item 58</b> <span style="float: right;"><b>7</b></span> <b>DECK</b> 1. Wearing Surface <span style="float: right;"><b>5</b></span> 2. Deck-Condition <span style="float: right;"><b>7</b></span> 3. Stay in Place Forms <span style="float: right;"><b>NA</b></span> 4. Curbs <span style="float: right;"><b>6</b></span> 5. Median <span style="float: right;"><b>NA</b></span> 6. Sidewalks <span style="float: right;"><b>NA</b></span> 7. Parapet <span style="float: right;"><b>NA</b></span> 8. Railing <span style="float: right;"><b>8</b></span> 9. Anti Missile Fence <span style="float: right;"><b>NA</b></span> 10. Drains <span style="float: right;"><b>8</b></span> 11. Lighting Standards <span style="float: right;"><b>8</b></span> 12. Utilities <span style="float: right;"><b>8</b></span> 13. Deck Joints <span style="float: right;"><b>7</b></span> 14. Approach Settlement <span style="float: right;"><b>7</b></span>	<b>item 59</b> <span style="float: right;"><b>8</b></span> <b>SUPERSTRUCTURE</b> 1. Bearing Devices <span style="float: right;"><b>7</b></span> 2. Stringers <span style="float: right;"><b>8</b></span> 3. Diaphragms <span style="float: right;"><b>8</b></span> 4. Girders or Beams <span style="float: right;"><b>8</b></span> 5. Floor Beams <span style="float: right;"><b>NA</b></span> 6. Trusses <span style="float: right;"><b>NA</b></span> 7. Rivets or Bolts <span style="float: right;"><b>8</b></span> 8. Welds <span style="float: right;"><b>NA</b></span> 9. Collision Damage <span style="float: right;"><b>NA</b></span> 10. Load Deflection <span style="float: right;"><b>8</b></span> 11. Member Alignment <span style="float: right;"><b>8</b></span> 12. Load Vibration <span style="float: right;"><b>8</b></span> 13. Paint-Epoxy <span style="float: right;"><b>8</b></span> 14. Year Painted <span style="float: right;"><b>90</b></span> 15. Under Clearance <b>NA</b> ft <b>NA</b> in Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<b>item 60</b> <span style="float: right;"><b>7</b></span> <b>SUBSTRUCTURE</b> 1. Abutments a-Wings <span style="float: right;"><b>7</b></span> b-Backwall <span style="float: right;"><b>7</b></span> c-Bridge Seats <span style="float: right;"><b>7</b></span> d-Breastwall <span style="float: right;"><b>7</b></span> e-Footings <span style="float: right;"><b>IA</b></span> f-Piles <span style="float: right;"><b>NA</b></span> g-Erosion <span style="float: right;"><b>8</b></span> h-Settlement <span style="float: right;"><b>8</b></span> 2. Piers or Bents a-Caps <span style="float: right;"><b>NA</b></span> b-Column <span style="float: right;"><b>NA</b></span> c-Web <span style="float: right;"><b>NA</b></span> d-Footing <span style="float: right;"><b>NA</b></span> e-Piles <span style="float: right;"><b>NA</b></span> f-Scour <span style="float: right;"><b>NA</b></span> g-Settlement <span style="float: right;"><b>NA</b></span> 3. Collision Damage <span style="float: right;"><b>8</b></span> 4. Hydraulic-Adequacy <span style="float: right;"><b>8</b></span>
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Actual Posting H 3 3S2 <span style="float: right;"><b>13 17 26</b></span> Recommended Posting From Rating Book <span style="float: right;"><b>13 17 26</b></span>	Single <span style="float: right;"><b>NA</b></span> advance <span style="float: right;"><b>NA</b></span>	Overhead Signs (attached to bridge) <input type="checkbox"/> yes <input checked="" type="checkbox"/> no 1. Welds <span style="float: right;"><b>NA</b></span> 2. Bolts <span style="float: right;"><b>NA</b></span> 3. Condition <span style="float: right;"><b>NA</b></span>
SIGNS IN PLACE Y or N <span style="float: right;"><b>Y</b></span>		Item 93b U/W Inspection Date: _____
LEGIBILITY <span style="float: right;"><b>8</b></span>		

<b>ITEM 61-channel and channel protection</b> <span style="float: right;"><b>7</b></span> 1. channel scour <span style="float: right;"><b>8</b></span> 2. embankment erosion <span style="float: right;"><b>8</b></span> 3. fender system <span style="float: right;"><b>NA</b></span> 4. spur dikes & jetties <span style="float: right;"><b>NA</b></span> 5. rip rap or slope paving <span style="float: right;"><b>NA</b></span> 6. effectiveness <span style="float: right;"><b>NA</b></span> 7. debris <span style="float: right;"><b>7</b></span> 8. vegetation <span style="float: right;"><b>7</b></span>	<b>36-Traffic Safety features</b> 1. bridge railing <span style="float: right;"><b>36 1 8</b></span> 2. transitions <span style="float: right;"><b>1 8</b></span> 3. approach guardrail <span style="float: right;"><b>1 7</b></span> 4. guardrail terminal <span style="float: right;"><b>1 8</b></span>
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**X=UNKNOWN      NA=NOT APPLICABLE      IA=INACCESSIBLE**

NBI Metric Structural Inventory and Appraisal

Date Printed: 09/02/98

(202) Corps of Engineers Structure Number: CEPNEDMA2510011

(8) NBI Structure Number: CEPNEDMA2510011

Geographic and Route Data

Dimensional Data

Inspection Data

(1) State Massachusetts  
(2) District 00  
(3) County 000  
(4) Place 00000  
(6) Feature Under SPILLWAY CHANNEL  
(7) Facility on ACCESS ROAD  
(9) Location 12.9 KM S OF GARDNER  
(16) Latitude 42° 25' 24.00"  
(17) Longitude 072° 01' 30.00"  
(98) Border Bridge  
(99) Border Bridge Str No  
(103) Temporary Str

(32) Approach Rdwy Width 5.5 M  
(39) Navigation Vert Clr 0.0 M  
(40) Navigation Horz Clr 0.0 M  
(48) Max Span Length 0029.0 M  
(49) Str Length 00029.6 M  
(50) Curb/Sidewalk Width Left 00.4 M  
Right 00.4 M  
(51) Brg Rdwy Width, curb-curb 005.5 M  
(52) Deck Width out-out 006.3 M  
(53) Min Vert Clr over 99.99 M  
(54) Min Vert Clr under N 00.00 M  
(55) Min Lat Underclr R N 00.0 M  
(56) Min Lat Underclr L 99.9 M  
(112) NBIS Bridge Length Y  
(116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0698  
(91) Inspection Frequency 24 Mo  
(92) Critical Feature Insp (93) Date  
Frac Crit Insp : N 00 /  
Underwater Insp: N 00 /  
Other Spec Insp: N 00 /

On and Under Record Data

Route On

(5) Inventory Route 168000000  
(10) Min Vert Clr 99.99 M  
(11) Kilometer Point 0000.000  
(19) Detour Length 008 km  
(20) Toll 3  
(26) Func Class 09  
(28) Lanes on/under 0200  
(29) ADT 50  
(30) Year of ADT 1998  
(47) Total Horz Clearance 05.5 M  
(100) Defense Hwy 0  
(101) Parallel Str N  
(102) Direction of Traffic 2  
(104) Hwy System 0  
(109) Truck Traffic 04%  
(110) Natl Truck Network No

Proposed Improvements

(75) Type of Work 351  
(76) Improvement Length 000290 M  
(94) Bridge Improv Cost 30  
(95) Rdwy Improv Cost 0  
(96) Total Proj Cost 30  
(97) Year of Cost Est 1998  
(114) Future ADT 50  
(115) Year of Future ADT 2015

Condition Rating

(58) Deck 7  
(59) Superstructure 8  
(60) Substructure 7  
(61) Channel & Channel Protect 7  
(62) Culverts N

General Data

(21) Maintenance Responsibility 70  
(22) Owner 70  
(31) Design Load 2  
(33) Bridge Median 0  
(34) Skew 00 deg  
(35) Str Flared No  
(37) Hist Significance 5  
(38) Navigation Control N  
(42) Type of Service 59  
(43) Structure Type Main 302  
(44) Structure Type Approach 000  
(45) No of Span Main 001  
(46) No of Approach Spans 0000  
(27) Year Built 1957  
(106) Year Reconstructed 0000  
(107) Deck Str Type 1  
(108) Wear Surf/Protv Sys 500  
(111) Nav Pier/Abut Protection

Appraisal Rating

(67) Structure Evaluation 4  
(68) Deck Geometry 4  
(69) Underclrn Vert & Horz N  
(71) Waterway Adequacy 9  
(72) Approach Rdwy Alignment 6  
(36) Traffic Safety Features 1111  
(113) Scour Critical Bridges 8

Load Rate and Post

(41) Str Open/Post/Close Open  
(64) Operating Rating 19.1 ton  
(66) Inventory Rating 11.8 ton  
(70) Bridge Posting 5

Over 200 Items

(200) COE MSC CENAD  
(201) COE District CENAE  
(202) Structure Number CEPNEDMA2510011  
(203) Inspection Office EPDG  
(204) Inspector JOE COLUCCI  
(205) Inspection Cost 007000  
(206) Cooper's Loading  
(207) Railroad Stru Number  
(208) Name of Railroad  
(209) Recommended Speed Limit  
(210) Posted Speed Limit (KPH)  
(211) MACOM  
(212) Installation Name  
(213) Military Wheel Load Class  
(214) Military Truck Load Class  
(215) Installation Number  
(216) Seismic Category  
(217) Acceleration Coefficient 0.00  
(218) Soil Site Coefficient 0.0

Sufficiency Rating = 065.5

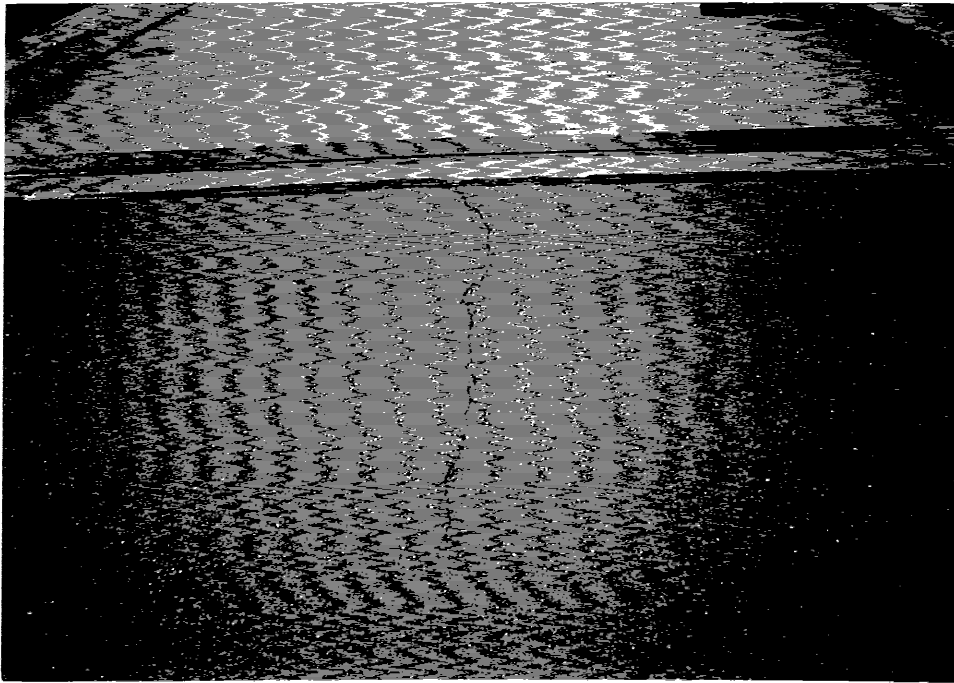


PHOTO NO. 1      Longitudinal crack at East Approach

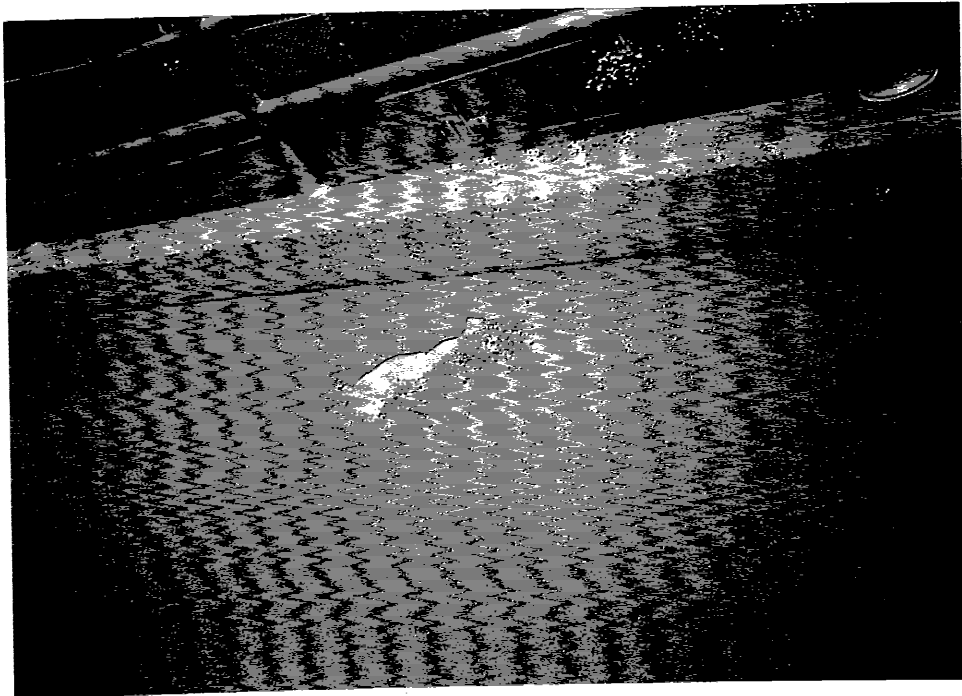


PHOTO NO. 2      Deteriorated Epoxy on the Bridge Deck



PHOTO NO. 3 Concrete Spall at the curb along the North side

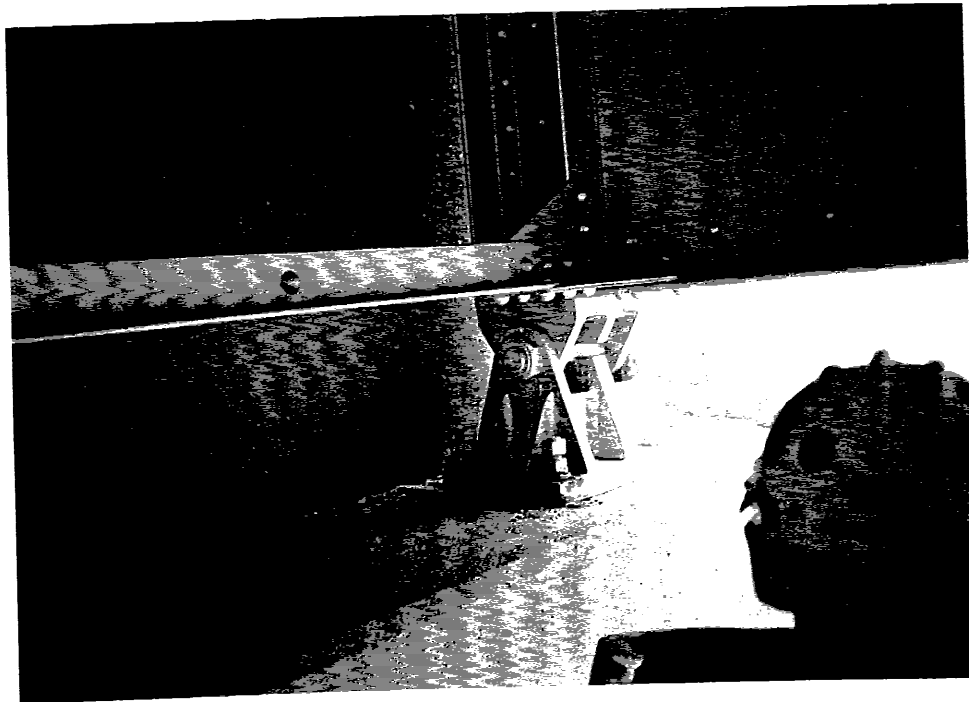


PHOTO NO. 4 Typical minor to moderate rust at the bearings

EVERETT LAKE  
SPILLWAY BRIDGE  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION: 25 June 1998.

DATE OF PREVIOUS INSPECTIONS: Routine Inspection: 8 May 1996.  
Routine Inspection: 28 June 1994.  
Routine Inspection: 22 July 1992.  
Routine Inspection: 22 May 1990.  
Inventory Inspection: 13 June 1984.

RATING (T = TONS)

Type	Inventory	Operating	Comments
H	40T	72T	No change due to inspection findings.
Type 3	44T	77T	
Type 3S2	53T	92T	
Type 3-3	59T	102T	

BRIDGE DESCRIPTION AND HISTORY

The bridge was constructed in 1961. It is a two span, composite deck welded plate girder bridge. Both spans are simple spans (each span is 93'-0" center to center of bearings) with a reinforced concrete deck supported by three girders with 66" webs spaced at 8'-6" center to center. Roadway width is 20'-0" between 1'-1" wide concrete curbs supporting aluminum guard rails 3'-0" high. The deck slab varies in thickness from 8" at the curbs to 10-1/2" at the centerline. The east and west abutments and the center pier are gravity structures.

EVALUATION

A. Superstructure- Above Deck

Overall condition is good. Moderate rusting on expansion dam plates, and light surface abrasion on the concrete deck surface was noted. There is freestanding water at a low spot at mid-span on the south side of the deck (8'x12"x 1/4" deep). Expansion joint material is in good condition. Curbs, scuppers are all in good condition. All light poles have been removed, with electrical wires exposed. Both approaches are in good condition. There is separation of bituminous pavement on the edge of the southeast approach approximately 15' long by 12" wide just inside of the guard rail.

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <u>Worcester, N.H.</u>		bridge dept. no.	8-structure no. <u>CEPNEDNH 3310001</u>	90-date inspected <u>6/25/98</u>
2-dist. <u>104-highway system</u> <u>NON-FEDERAL AID</u>	22-owner <u>70 COE</u>	27-year built <u>1961</u>	106-year rebuilt <u>NA</u>	11-milepoint <u>—</u>
43-structure type <u>302 TWO SPAN MULTI-GIRDER W/COMPOSITE DECK</u>		quality control engineer <u>NICK FORBES</u>		
07-facility carried <u>EVERETT LAKE ACCESS ROAD</u>		team leader <u>JOE COLUCCI</u>		
06-features intersected <u>EVERETT LAKE SPILLWAY CHANNEL</u>		team members <u>ED MILLS</u>		

<p>item 58 <span style="float: right;">7</span></p> <p>DECK</p> <p>1. Wearing Surface <span style="float: right;">7</span></p> <p>2. Deck-Condition <span style="float: right;">7</span></p> <p>3. Stay in Place Forms <span style="float: right;">NA</span></p> <p>4. Curbs <span style="float: right;">7</span></p> <p>5. Median <span style="float: right;">NA</span></p> <p>6. Sidewalks <span style="float: right;">NA</span></p> <p>7. Parapet <span style="float: right;">NA</span></p> <p>8. Railing <span style="float: right;">7</span></p> <p>Anti Missile Fence <span style="float: right;">NA</span></p> <p>10. Drains <span style="float: right;">8</span></p> <p>11. Lighting Standards <span style="float: right;">NA</span></p> <p>12. Utilities <span style="float: right;">NA</span></p> <p>13. Deck Joints <span style="float: right;">7</span></p> <p>14. Approach Settlement <span style="float: right;">6</span></p>	<p>item 59 <span style="float: right;">7</span></p> <p>SUPERSTRUCTURE</p> <p>1. Bearing Devices <span style="float: right;">7</span></p> <p>2. Stringers <span style="float: right;">NA</span></p> <p>3. Diaphragms <span style="float: right;">8</span></p> <p>4. Girders or Beams <span style="float: right;">7</span></p> <p>5. Floor Beams <span style="float: right;">NA</span></p> <p>6. Trusses <span style="float: right;">NA</span></p> <p>7. Rivets or Bolts <span style="float: right;">7</span></p> <p>8. Welds <span style="float: right;">8</span></p> <p>9. Collision Damage <span style="float: right;">NA</span></p> <p>10. Load Deflection <span style="float: right;">7</span></p> <p>11. Member Alignment <span style="float: right;">8</span></p> <p>12. Load Vibration <span style="float: right;">7</span></p> <p>13. Paint-Epoxy <span style="float: right;">7</span></p> <p>14. Year Painted <span style="float: right;">—</span></p> <p>15. Under Clearance <u>—</u> ft <u>—</u> in</p> <p>Clearance Signs <input type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>item 60 <span style="float: right;">7</span></p> <p>SUBSTRUCTURE</p> <p>1. Abutments</p> <p>a-Wings <span style="float: right;">7</span></p> <p>b-Backwall <span style="float: right;">7</span></p> <p>c-Bridge Seats <span style="float: right;">7</span></p> <p>d-Breastwall <span style="float: right;">7</span></p> <p>e-Footings <span style="float: right;">—</span></p> <p>f-Piles <span style="float: right;">—</span></p> <p>g-Erosion <span style="float: right;">7</span></p> <p>h-Settlement <span style="float: right;">7</span></p> <p>2. Piers or Bents</p> <p>a-Caps <span style="float: right;">7</span></p> <p>b-Column <span style="float: right;">7</span></p> <p>c-Web <span style="float: right;">NA</span></p> <p>d-Footing <span style="float: right;">—</span></p> <p>e-Piles <span style="float: right;">—</span></p> <p>f-Scour <span style="float: right;">NA</span></p> <p>g-Settlement <span style="float: right;">8</span></p> <p>3. Collision Damage <span style="float: right;">NA</span></p> <p>4. Hydraulic-Adequacy <span style="float: right;">8</span></p>
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<p>Actual Posting</p> <p>H 3 3S2</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Recommended Posting</p> <p>From Rating Book <u>40</u> <u>44</u> <u>53</u></p> <p>SIGNS IN PLACE</p> <p>Y or N <u>N</u></p> <p>LEGIBILITY <input type="checkbox"/></p>	<p>Single <input type="checkbox"/></p> <p>advance <u>N</u></p> <p><input type="checkbox"/></p>	<p>Overhead Signs (attached to bridge)</p> <p><input type="checkbox"/> yes <input checked="" type="checkbox"/> no</p> <p>1. Welds <span style="float: right;">NA</span></p> <p>2. Bolts <span style="float: right;">NA</span></p> <p>3. Condition <span style="float: right;">NA</span></p> <p>Item 93b U/W Inspection Date: _____</p>
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<p>ITEM 61-channel and channel protection <span style="float: right;">8</span></p> <p>channel scour <span style="float: right;">8</span></p> <p>mbankment erosion <span style="float: right;">8</span></p> <p>fender system <span style="float: right;">NA</span></p> <p>spur dikes &amp; jetties <span style="float: right;">NA</span></p> <p>5. rip rap or slope paving <span style="float: right;">NA</span></p> <p>6. effectiveness <span style="float: right;">8</span></p> <p>7. debris <span style="float: right;">8</span></p> <p>8. vegetation <span style="float: right;">8</span></p>	<p>36-Traffic Safety features</p> <p>36 condition</p> <p>1. bridge railing <span style="float: right;">7</span></p> <p>2. transitions <span style="float: right;">8</span></p> <p>3. approach guardrail <span style="float: right;">7</span></p> <p>4. guardrail terminal <span style="float: right;">8</span></p>
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**X=UNKNOWN**

**NA=NOT APPLICABLE**

**IA=INACCESSIBLE**

NBI Metric Structural Inventory and Appraisal

Date Printed: 09/02/98

(202) Corps of Engineers Structure Number: CEPNEDNH3310001

(8) NBI Structure Number: CEPNEDNH3310001

Geographic and Route Data

Dimensional Data

Inspection Data

(1) State New Hampshire  
(2) District 00  
(3) County 000  
(4) Place 00000  
(6) Feature Under EVERTT LAKE SPILLWAY  
(7) Facility on EV LAKE ACCESS RD  
(9) Location 16.09 KM SW OF CONCORD NH  
(16) Latitude 43° 05' 36.00"  
(17) Longitude 071° 35' 30.00"  
(98) Border Bridge  
(99) Border Bridge Str No  
(103) Temporary Str

(32) Approach Rdwy Width 6.1 M  
(39) Navigation Vert Clr 0.0 M  
(40) Navigation Horz Clr 0.0 M  
(48) Max Span Length 0028.4 M  
(49) Str Length 00056.7 M  
(50) Curb/Sidewalk Width Left 00.3 M  
Right 00.3 M  
(51) Brg Rdwy Width, curb-curb 006.1 M  
(52) Deck Width out-out 006.7 M  
(53) Min Vert Clr over 99.99 M  
(54) Min Vert Clr under N 00.00 M  
(55) Min Lat Underclr R N 00.0 M  
(56) Min Lat Underclr L 99.9 M  
(112) NBIS Bridge Length Y  
(116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0698  
(91) Inspection Frequency 24 Mo  
(92) Critical Feature Insp (93) Date  
Frac Crit Insp : N 00 /  
Underwater Insp: N 00 /  
Other Spec Insp: N 00 /

On and Under Record Data

Route On  
(5) Inventory Route 168000000  
(10) Min Vert Clr 99.99 M  
(11) Kilometer Point 0000.000  
(19) Detour Length 005 km  
(20) Toll 3  
(26) Func Class 09  
(28) Lanes on/under 0200  
(29) ADT 50  
(30) Year of ADT 1998  
(47) Total Horz Clearance 06.1 M  
(100) Defense Hwy 0  
(101) Parallel Str N  
(102) Direction of Traffic 2  
(104) Hwy System 0  
(109) Truck Traffic 00%  
(110) Natl Truck Network No

Proposed Improvements  
(75) Type of Work  
(76) Improvement Length 000000 M  
(94) Bridge Improv Cost 0  
(95) Rdwy Improv Cost 0  
(96) Total Proj Cost 0  
(97) Year of Cost Est 50  
(114) Future ADT 2015  
(115) Year of Future ADT 2015

Condition Rating  
(58) Deck 7  
(59) Superstructure 7  
(60) Substructure 7  
(61) Channel & Channel Protect 8  
(62) Culverts N

General Data

Appraisal Rating

(21) Maintenance Responsibility 70  
(22) Owner 70  
(31) Design Load 4  
(33) Bridge Median 0  
(34) Skew 00 deg  
(35) Str Flared No  
(37) Hist Significance 5  
(38) Navigation Control N  
(42) Type of Service 59  
(43) Structure Type Main 302  
(44) Structure Type Approach 000  
(45) No of Span Main 002  
(46) No of Approach Spans 0000  
(27) Year Built 1961  
(106) Year Reconstructed 0000  
(107) Deck Str Type 1  
(108) Wear Surf/Protv Sys 000  
(111) Nav Pier/Abut Protection

(67) Structure Evaluation 7  
(68) Deck Geometry 5  
(69) Underclrn Vert & Horz N  
(71) Waterway Adequacy 9  
(72) Approach Rdwy Alignment 9  
(36) Traffic Safety Features 1111  
(113) Scour Critical Bridges 8

Load Rate and Post

(41) Str Open/Post/Close Open  
(64) Operating Rating 65.3 ton  
(66) Inventory Rating 36.3 ton  
(70) Bridge Posting 5

Sufficiency Rating = 099.0

Over 200 Items  
(200) COE MSC CENAD  
(201) COE District CENAE  
(202) Structure Number CEPNEDNH3310001  
(203) Inspection Office EPDG  
(204) Inspector JOE COLUCCI  
(205) Inspection Cost 009000  
(206) Cooper's Loading  
(207) Railroad Stru Number  
(208) Name of Railroad  
(209) Recommended Speed Limit  
(210) Posted Speed Limit (KPH)  
(211) MACOM  
(212) Installation Name  
(213) Military Wheel Load Class  
(214) Military Truck Load Class  
(215) Installation Number  
(216) Seismic Category  
(217) Acceleration Coefficient 0.00  
(218) Soil Site Coefficient 0.0

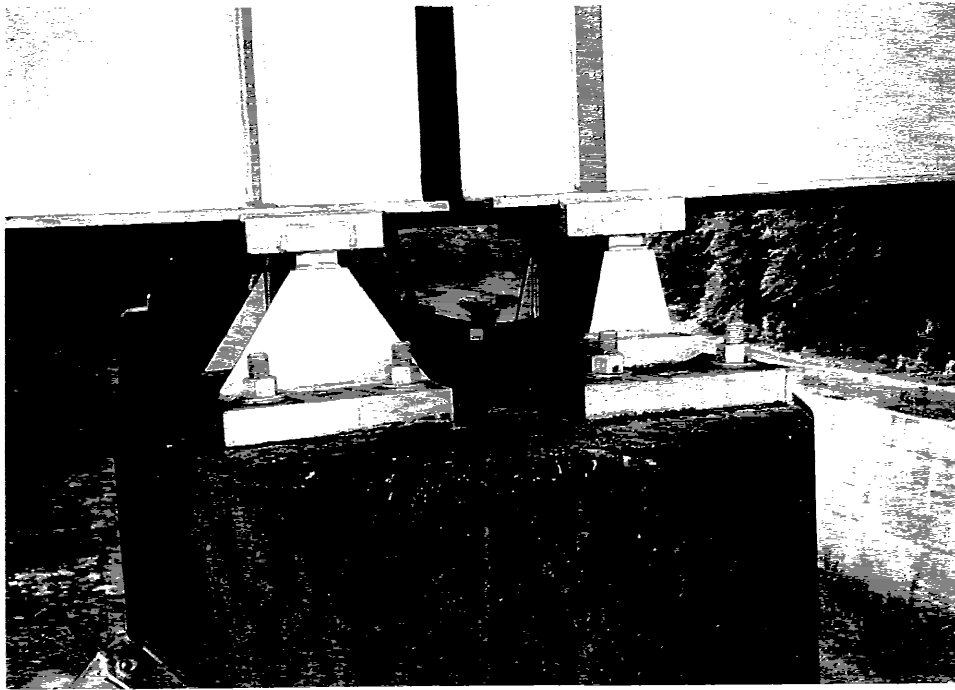


PHOTO 1. THE CENTER PIER OF THE DOWNSTREAM BASE HAS MINOR HAIRLINE CRACKS WITH EFFLORESCENCE.



PHOTO 2. SEPARATION OF BITUMINOUS PAVEMENT AT SOUTH EAST GUARD RAIL





PHOTO 3. FREE STANDING WATER ON DECK

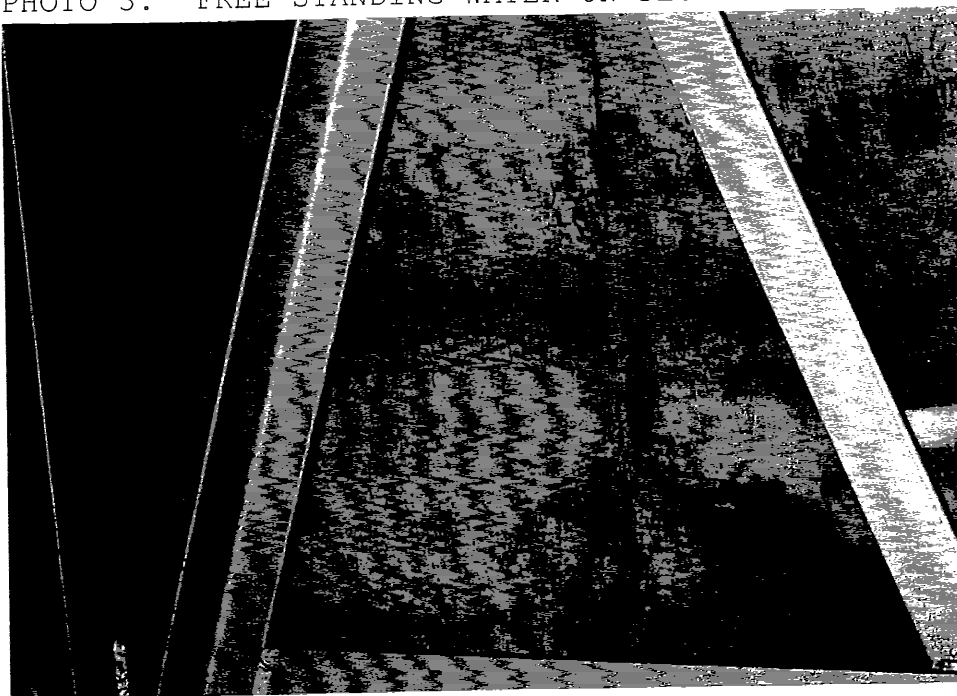


PHOTO 4. VERTICAL CRACK AT BACK WALL OF WEST ABUTMENT  
AT MIDDLE GIRDER

SURRY MOUNTAIN  
SPILLWAY BRIDGE  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION: 26 June, 1998

DATE OF PREVIOUS INSPECTIONS: Routine Inspection, 11 September 96.  
Routine Inspection, 1 July 92.  
Routine Inspection, 23 May 90.  
Routine Inspection, 7 June 88.  
Inventory Inspection, 12 June 84.

RATING (T= TONS):

Type	Inventory	Operating	Comments
H	22T	43T	No change due
Type 3	30T	57T	to inspection
Type 352	36T	65T	findings
Type 3-3	40T	70T	

BRIDGE DESCRIPTION AND HISTORY

The access bridge over the spillway channel at Surry Mountain Lake is a three span combination deck welded plate girder (spans 2 and 3) and rolled beam (span 1) bridge with spans of 44'-9 3/4" (span 1), 93'-6" (span 2) and 93'-6" (span 3) center to center of bearings. All spans are simple spans with reinforced concrete deck. Roadway width varies from 16' to 12' curb to curb on span 1, while holding a constant 12' curb to curb distance on spans 2 and 3. A 1'-3" wide concrete curb on each sides support aluminum guard rails 3'-0" high.

The composite action concrete deck is supported by two W36 X 150 rolled steel beams variably spaced from 11'-6" to 7'-6" on center in span 1 and by two welded plate girders with 60" webs spaced 7'-6" on center in spans 2 and 3. The spacing of lateral bracing varies from 12' to 14'-6" on center. All lateral bracing is welded. The west abutment is a concrete stub abutment. Piers 1 and 2 are solid rectangular reinforced concrete piers. Pier 1 has a stepped seat to accommodate the rolled beams from span 1 and the plate girders from span 2. Pier 2 is set on top of the retaining wall on the west side of the spillway channel. The east abutment is a concrete stub abutment with flared wingwalls. The current structure was constructed in 1962. The east abutment was constructed in 1941.

In 1995 a 1 1/2" bonded, fiber-reinforced concrete overlay was placed over the existing deck surface after removing approximately 1/2" during surface preparation.

EVALUATION: (See attached "Structures Inspection Field Report")

A. Superstructure Above Deck

Overall condition still good. Deck surface is in excellent condition and appears to be draining properly; some sand accumulation was noticed along the north curb. There is a 15"x3"x4" deep spall on the outside face of the north curb near the east end of span 1. The bituminous concrete pavement at the east and west approaches are in good condition. The bottom of steel rebar chains which rust stain the bottom of the curbs were noted, but unchanged from previous inspections. Drains and bridge rails are in good condition.

B. Superstructure Below Deck

Overall condition still good. Structural steel in good condition. There is moderate rusting on the top of the bottom flanges at the ends of the girders in spans 2 and 3. In general, rusting is slightly more advanced than during the previous inspection. The underside of the concrete deck is also in good condition with some minor efflorescence below the curbs and deck at the joints. (see photo. 3)

C. Bearings

Overall condition is still good. All bearings appear to be functioning properly. At 80 F, the following clearances were measured: 5 and 3-1/2 inches from end of south and north W 36 X 150 beams to west abutment backwall, respectively; 4-1/4 and 3-5/8 inches from end of south and north W36 X 150 to east abutment back wall respectively. There is a 2 inches opening in roadway joint at pier no. 2. Slight to moderate rust observed at all bearings. There is moderate rusting on isolated bolts and on the steel plates under the bridge deck. (see photo. No. 1 & 2).

D. Substructure

Concrete at west abutment, pier no. 1, and pier no. 2 is in good condition with no deficiencies to report. East abutment exhibits fine pattern cracking and minor efflorescence on the surface but otherwise is in good condition.

E. Overall Numerical Condition Rating:

Inventory	1984:	7
Routine	1990:	8
Routine	1992:	7
Routine	1994:	7
Routine	1996:	8
Routine	1998:	7

RECOMMENDATIONS:

Status of Previous Recommendations

1. Repair the concrete spall at the bridge rail curb end.

Done

Revised Recommendations

1. Replace the loose or deteriorated rusty bolts.

Estimated Cost	\$2,000
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2. The bridge has not been painted since 1975 and the overall paint condition has been gradually deteriorating over the past few years. Based on this, cleaning and painting of all structural steel and bearings should be scheduled within the next five years.

Estimated Cost	\$150,000
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Total	\$152,000
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# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>KEENE, NH</b>		bridge dept. no.		8-structure no. <b>CEPNEE.NH33100A3</b>		90-date inspected <b>6/26/98</b>	
1. 104-highway system <b>NON FEDERAL - AID</b>		22-owner <b>COE</b>		27-year built <b>1962</b>		106-year rebuilt	
43-structure type <b>Three Span Combination Welded Plate Girder (Span 2 &amp; 3) and Rolled Beam (Span 1)</b>				quality control engineer <b>N. FORBES</b>			
07-facility carried <b>ACCESS ROAD</b>				team leader <b>J. Colucci</b>			
06-features intersected <b>SPILLWAY CHANNEL</b>				team members <b>Francis Fung &amp; Ed Mills</b>			

<p>item 58 <span style="float: right;"><b>7</b></span></p> <p>DECK</p> <table style="width: 100%;"> <tr><td>1. Wearing Surface</td><td style="text-align: right;"><b>8</b></td></tr> <tr><td>2. Deck-Condition</td><td style="text-align: right;"><b>7</b></td></tr> <tr><td>3. Stay in Place Forms</td><td style="text-align: right;"><b>NA</b></td></tr> <tr><td>4. Curbs</td><td style="text-align: right;"><b>7</b></td></tr> <tr><td>5. Median</td><td style="text-align: right;"><b>NA</b></td></tr> <tr><td>6. Sidewalks</td><td style="text-align: right;"><b>NA</b></td></tr> <tr><td>7. Parapet</td><td style="text-align: right;"><b>NA</b></td></tr> <tr><td>8. Railing</td><td style="text-align: right;"><b>7</b></td></tr> <tr><td>9. Anti Missile Fence</td><td style="text-align: right;"><b>NA</b></td></tr> <tr><td>10. Drains</td><td style="text-align: right;"><b>8</b></td></tr> <tr><td>11. Lighting Standards</td><td style="text-align: right;"><b>NA</b></td></tr> <tr><td>12. Utilities</td><td style="text-align: right;"><b>8</b></td></tr> <tr><td>13. Deck Joints</td><td style="text-align: right;"><b>7</b></td></tr> <tr><td>14. Approach Settlement</td><td style="text-align: right;"><b>7</b></td></tr> </table>	1. Wearing Surface	<b>8</b>	2. Deck-Condition	<b>7</b>	3. Stay in Place Forms	<b>NA</b>	4. Curbs	<b>7</b>	5. Median	<b>NA</b>	6. Sidewalks	<b>NA</b>	7. Parapet	<b>NA</b>	8. Railing	<b>7</b>	9. Anti Missile Fence	<b>NA</b>	10. Drains	<b>8</b>	11. Lighting Standards	<b>NA</b>	12. Utilities	<b>8</b>	13. Deck Joints	<b>7</b>	14. Approach Settlement	<b>7</b>	<p>item 59 <span style="float: right;"><b>7</b></span></p> <p>SUPERSTRUCTURE</p> <table style="width: 100%;"> <tr><td>1. Bearing Devices</td><td style="text-align: right;"><b>6</b></td></tr> <tr><td>2. Stringers</td><td style="text-align: right;"><b>8</b></td></tr> <tr><td>3. Diaphragms</td><td style="text-align: right;"><b>8</b></td></tr> <tr><td>4. 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2. Bolts	<b>NA</b>						
3. Condition	<b>NA</b>						

<p>ITEM 61-channel and channel protection <span style="float: right;"><b>8</b></span></p> <table style="width: 100%;"> <tr><td>1. channel scour</td><td style="text-align: right;"><b>8</b></td><td>5. rip rap or slope paving</td><td style="text-align: right;"><b>8</b></td></tr> <tr><td>2. embankment erosion</td><td style="text-align: right;"><b>8</b></td><td>6. effectiveness</td><td style="text-align: right;"><b>8</b></td></tr> <tr><td>3. fender system</td><td style="text-align: right;"><b>NA</b></td><td>7. debris</td><td style="text-align: right;"><b>7</b></td></tr> <tr><td>4. spur dikes &amp; jetties</td><td style="text-align: right;"><b>NA</b></td><td>8. vegetation</td><td style="text-align: right;"><b>7</b></td></tr> </table>	1. channel scour	<b>8</b>	5. rip rap or slope paving	<b>8</b>	2. embankment erosion	<b>8</b>	6. effectiveness	<b>8</b>	3. fender system	<b>NA</b>	7. debris	<b>7</b>	4. spur dikes & jetties	<b>NA</b>	8. vegetation	<b>7</b>	<p>36-Traffic Safety features</p> <table style="width: 100%;"> <tr><td>1. bridge railing</td><td style="text-align: right;"><b>1</b></td><td>36 condition</td><td style="text-align: right;"><b>7</b></td></tr> <tr><td>2. transitions</td><td style="text-align: right;"><b>0</b></td><td></td><td style="text-align: right;"><b>7</b></td></tr> <tr><td>3. approach guardrail</td><td style="text-align: right;"><b>1</b></td><td></td><td style="text-align: right;"><b>8</b></td></tr> <tr><td>4. guardrail terminal</td><td style="text-align: right;"><b>1</b></td><td></td><td style="text-align: right;"><b>7</b></td></tr> </table>	1. bridge railing	<b>1</b>	36 condition	<b>7</b>	2. transitions	<b>0</b>		<b>7</b>	3. approach guardrail	<b>1</b>		<b>8</b>	4. guardrail terminal	<b>1</b>		<b>7</b>
1. channel scour	<b>8</b>	5. rip rap or slope paving	<b>8</b>																														
2. embankment erosion	<b>8</b>	6. effectiveness	<b>8</b>																														
3. fender system	<b>NA</b>	7. debris	<b>7</b>																														
4. spur dikes & jetties	<b>NA</b>	8. vegetation	<b>7</b>																														
1. bridge railing	<b>1</b>	36 condition	<b>7</b>																														
2. transitions	<b>0</b>		<b>7</b>																														
3. approach guardrail	<b>1</b>		<b>8</b>																														
4. guardrail terminal	<b>1</b>		<b>7</b>																														

**X=UNKNOWN**
**NA=NOT APPLICABLE**
**IA=INACCESSIBLE**

## NBI Metric Structural Inventory and Appraisal

Date Printed: 09/08/1998

(202) Corps of Engineers Structure Number: CEPNEDNH3310003

(8) NBI Structure Number: CEPNEDNH3310003

## Geographic and Route Data

## Dimensional Data

## Inspection Data

(1) State New Hampshire  
 (2) District 00  
 (3) County 000  
 (4) Place 00000  
 (6) Feature Under SPILLWAY CHANNEL  
 (7) Facility on SURRY MT ACCESS RD  
 (9) Location 9.65 KM NORTH OF KEENE NH  
 (16) Latitude 42° 99' 12.00"  
 (17) Longitude 072° 17' 30.00"  
 (98) Border Bridge  
 (99) Border Bridge Str No  
 (103) Temporary Str

(32) Approach Rdwy Width 4.5 M  
 (39) Navigation Vert Clr 0.0 M  
 (40) Navigation Horz Clr 0.0 M  
 (48) Max Span Length 0028.5 M  
 (49) Str Length 00070.7 M  
 (50) Curb/Sidewalk Width Left 00.4 M  
 Right 00.4 M  
 (51) Brg Rdwy Width, curb-curb 003.7 M  
 (52) Deck Width out-out 004.5 M  
 (53) Min Vert Clr over 99.99 M  
 (54) Min Vert Clr under N 00.00 M  
 (55) Min Lat Underclr R N 00.0 M  
 (56) Min Lat Underclr L 99.9 M  
 (112) NBIS Bridge Length Y  
 (116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0698  
 (91) Inspection Frequency 24 Mo  
 (92) Critical Feature Insp (93) Date  
 Frac Crit Insp : Y 24 06/98  
 Underwater Insp: N 00 /  
 Other Spec Insp: N 00 /

## On and Under Record Data

## Route On

(5) Inventory Route 168000000  
 (10) Min Vert Clr 99.99 M  
 (11) Kilometer Point 0000.000  
 (19) Detour Length 016 km  
 (20) Toll 3  
 (26) Func Class 09  
 (28) Lanes on/under 0100  
 (29) ADT 25  
 (30) Year of ADT 1998  
 (47) Total Horz Clearance 04.5 M  
 (100) Defense Hwy 0  
 (101) Parallel Str N  
 (102) Direction of Traffic 3  
 (104) Hwy System 0  
 (109) Truck Traffic 02%  
 (110) Natl Truck Network No

## Proposed Improvements

(75) Type of Work 351  
 (76) Improvement Length 000707 M  
 (94) Bridge Improv Cost 152  
 (95) Rdwy Improv Cost 0  
 (96) Total Proj Cost 152  
 (97) Year of Cost Est 1998  
 (114) Future ADT 25  
 (115) Year of Future ADT 2015

## Condition Rating

(58) Deck 7  
 (59) Superstructure 7  
 (60) Substructure 8  
 (61) Channel & Channel Protect 8  
 (62) Culverts N

## General Data

(21) Maintenance Responsibility 70  
 (22) Owner 70  
 (31) Design Load 2  
 (33) Bridge Median 0  
 (34) Skew 00 deg  
 (35) Str Flared No  
 (37) Hist Significance 5  
 (38) Navigation Control N  
 (42) Type of Service 59  
 (43) Structure Type Main 302  
 (44) Structure Type Approach 000  
 (45) No of Span Main 003  
 (46) No of Approach Spans 0000  
 (27) Year Built 1962  
 (106) Year Reconstructed 0000  
 (107) Deck Str Type 1  
 (108) Wear Surf/Protv Sys 200  
 (111) Nav Pier/Abut Protection

## Appraisal Rating

(67) Structure Evaluation 5  
 (68) Deck Geometry 4  
 (69) Underclrn Vert & Horz N  
 (71) Waterway Adequacy 9  
 (72) Approach Rdwy Alignment 5  
 (36) Traffic Safety Features 1011  
 (113) Scour Critical Bridges 8

## Load Rate and Post

(41) Str Open/Post/Close Open  
 (64) Operating Rating 39.0 ton  
 (66) Inventory Rating 20.0 ton  
 (70) Bridge Posting 5

## Over 200 Items

(200) COE MSC CENAD  
 (201) COE District CENAE  
 (202) Structure Number CEPNEDNH3310003  
 (203) Inspection Office EPDG  
 (204) Inspector JOE COLUCCI  
 (205) Inspection Cost 009000  
 (206) Cooper's Loading  
 (207) Railroad Stru Number  
 (208) Name of Railroad  
 (209) Recommended Speed Limit  
 (210) Posted Speed Limit (KPH)  
 (211) MACOM  
 (212) Installation Name  
 (213) Military Wheel Load Class  
 (214) Military Truck Load Class  
 (215) Installation Number  
 (216) Seismic Category  
 (217) Acceleration Coefficient 0.00  
 (218) Soil Site Coefficient 0.0

Sufficiency Rating = 066.8

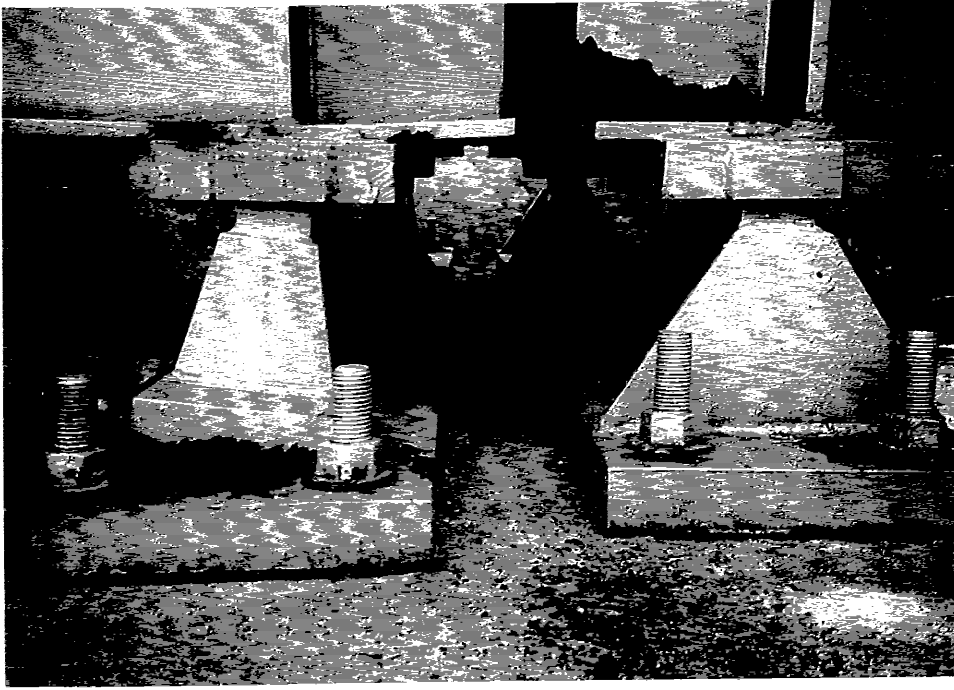


PHOTO NO. 1 Rusting on expansion rocker (left) and both bearing plates

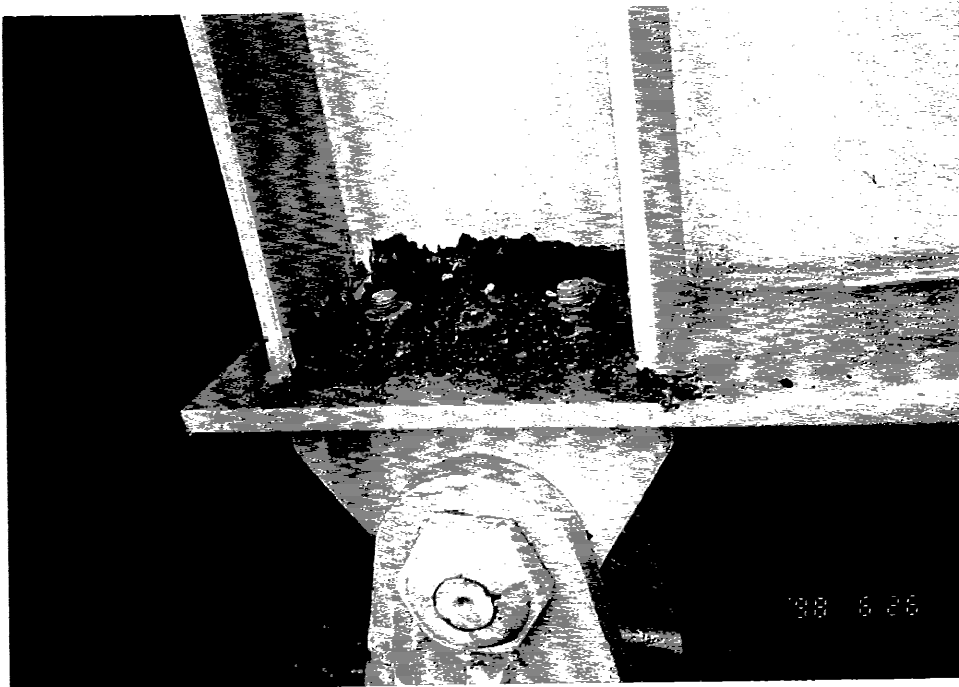


PHOTO NO. 2 Couple of the bolts rusting through on the top of the bridge seats.

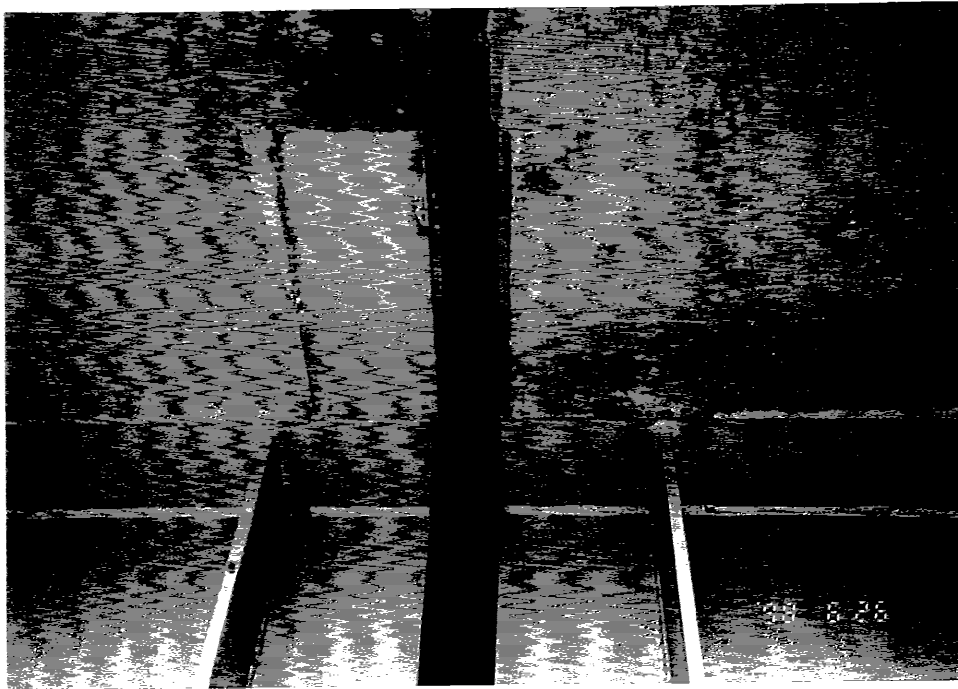


PHOTO NO. 3 Typical minor to moderate efflorescence on underside of deck near joints.



TOWNSHEND LAKE  
SPILLWAY BRIDGE  
TOWNSHEND, VT  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION: 27 June 1998

DATES OF PREVIOUS INSPECTIONS: Routine, 10 Sept 1996  
Routine, 22 Aug 1994  
Routine, 23 Aug 1992  
Routine, 24 July 1990  
Inventory, 18 May 1984

BRIDGE DESCRIPTION AND HISTORY

The spillway bridge at Townshend Lake is a single span, steel deck Pratt Truss. It was constructed in 1961 and provides access over the spillway channel at Townshend Lake. The span is 160'-0" center to center of bearings. Roadway width is 12'-4" between curbs, with 1'-6" safety walks and 3'-0" high steel rails on both sides. The deck consists of a 5" deep, open steel grating, supported by 12" deep rolled beams spaced transversely at 4'-0" center to center. The 12" rolled beams span 13'-4" between the two supporting trusses which are 20'-0" deep between top and bottom chord centers. Trusses consist of 8 panels, each 20'-0" long; all connections are of high strength bolts.

The substructure consists of L-type reinforced concrete abutments founded on rock shelves on either side of the spillway channel.

RATING (T=TONS)

Type	Inventory	Operating	Comments
H	19T	26T	No change in ratings due to inspection findings.
3	29T	40T	
3S2	48T	67T	
3-3	46T	64T	

member ends. Several bolts and nuts require replacement, and the member ends and bearings require thorough cleaning and painting.

#### D. Substructure

The overall condition of the concrete abutment bridge seats, back walls and breastwalls is good. Minor vertical, hairline cracks were noted in both back walls but were considered to be non-structural and insignificant. Vegetative and small tree growth were noted at the truss ends at both abutments.

#### E. Channel

The overall condition and alignment of the spillway channel is good with very little debris or growth noted.

#### CONDITION RATING

Routine,	1998	6
Routine,	1996	7
Routine,	1994	7
Routine,	1992	7
Routine,	1990	7
Inventory,	1984	7/8

#### RECOMMENDATIONS

##### Status of Previous Recommendations

- |  |          |
|--|----------|
| 1. Clean and Paint Expansion Dams.   | Not Done |
| 2. Refurbish bearings - tighten and/or replace nuts and bolts, grout voids under bearing plates. | Not Done |
| 3. Repair spalls and cracks on approach slabs.   | Not Done |
| 4. Repair damaged guard rail on Southeast approach.  | Not Done |

- |    |  |          |
|----|--|----------|
| 5. | Replace all corroded structural bolts<br>(> 25% section loss).                                   | Not Done |
| 6. | Replace approximately 50 feet of damaged<br>guard rail on Northwest and Southeast<br>approaches. | Not Done |

#### Revised Recommendations

Implement above recommendations and include the following:

- a. Replace rotted wood posts at the West approach.
- b. Clean and paint all the structural steel and bearings, taking particular care to thoroughly clean areas of significant rusting as described above.

#### Estimated Cost

a.	Replace Approach Slabs	\$15,000
b.	Replace/Repair Guardrails	\$4,000
c.	Replace Bolts/Nuts	\$6,000
d.	Clean and Paint	\$120,000
Total		\$145,000

Note: An FY 98 design has been completed to accomplish this work. The project has been issued and bids have been received; however, at this time, no contract has yet been awarded.

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>TOWNSHEND, VT</b>		bridge dept. no. <b>-</b>	8-structure no. <b>CERNED VT 5010002</b>	90-day inspected <b>6/27/98</b>
it. <b>104-highway system</b> <b>NON-FEDERAL RD</b>	22-owner <b>COR E</b>	27-year built <b>1961</b>	106-year rebuilt <b>N/A</b>	11-milepoint <b>-</b>
43-structure type <b>309 STEEL DECK TRUSS</b>		quality control engineer <b>NICK FOR BES</b>		
07-facility carried <b>TOWNSHEND LAKE ACCESS ROAD</b>		team leader <b>JOE COLUCCI</b>		
06-features intersected <b>TOWNSHEND LAKE SPILLWAY CHANNEL</b>		team members <b>JOE COLUCCI, ED MILLS</b>		

<b>item 58</b> <span style="float: right;"><b>7</b></span> <b>DECK</b> 1. Wearing Surface <span style="float: right;"><b>NA</b></span> 2. Deck-Condition <span style="float: right;"><b>7</b></span> 3. Stay in Place Forms <span style="float: right;"><b>NA</b></span> 4. Curbs <span style="float: right;"><b>7</b></span> 5. Median <span style="float: right;"><b>NA</b></span> 6. Sidewalks <span style="float: right;"><b>NA</b></span> 7. Parapet <span style="float: right;"><b>NA</b></span> 8. Railing <span style="float: right;"><b>7</b></span> 9. Anti Missile Fence <span style="float: right;"><b>NA</b></span> 10. Drains <span style="float: right;"><b>NA</b></span> 11. Lighting Standards <span style="float: right;"><b>NA</b></span> 12. Utilities <span style="float: right;"><b>NA</b></span> 13. Deck Joints <span style="float: right;"><b>7</b></span> 14. Approach Settlement <span style="float: right;"><b>7</b></span>	<b>item 59</b> <span style="float: right;"><b>6</b></span> <b>SUPERSTRUCTURE</b> 1. Bearing Devices <span style="float: right;"><b>6</b></span> 2. Stringers <span style="float: right;"><b>NA</b></span> 3. Diaphragms <span style="float: right;"><b>7</b></span> 4. Girders or Beams <span style="float: right;"><b>NA</b></span> 5. Floor Beams <span style="float: right;"><b>7</b></span> 6. Trusses <span style="float: right;"><b>7</b></span> 7. Rivets or Bolts <span style="float: right;"><b>6</b></span> 8. Welds <span style="float: right;"><b>NA</b></span> 9. Collision Damage <span style="float: right;"><b>8</b></span> 10. Load Deflection <span style="float: right;"><b>7</b></span> 11. Member Alignment <span style="float: right;"><b>7</b></span> 12. Load Vibration <span style="float: right;"><b>7</b></span> 13. Paint-Epoxy <span style="float: right;"><b>6</b></span> 14. Year Painted <span style="float: right;"><b>1-</b></span> 15. Under Clearance _____ ft _____ in Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<b>item 60</b> <span style="float: right;"><b>7</b></span> <b>SUBSTRUCTURE</b> 1. Abutments a-Wings <span style="float: right;"><b>NA</b></span> b-Backwall <span style="float: right;"><b>7</b></span> c-Bridge Seats <span style="float: right;"><b>7</b></span> d-Breastwall <span style="float: right;"><b>7</b></span> e-Footings <span style="float: right;"><b>NA</b></span> f-Piles <span style="float: right;"><b>NA</b></span> g-Erosion <span style="float: right;"><b>7</b></span> h-Settlement <span style="float: right;"><b>7</b></span> 2. Piers or Bents a-Caps <span style="float: right;"><b>NA</b></span> b-Column <span style="float: right;"><b>NA</b></span> c-Web <span style="float: right;"><b>NA</b></span> d-Footing <span style="float: right;"><b>NA</b></span> e-Piles <span style="float: right;"><b>NA</b></span> f-Scour <span style="float: right;"><b>NA</b></span> g-Settlement <span style="float: right;"><b>NA</b></span> 3. Collision Damage <span style="float: right;"><b>8</b></span> 4. Hydraulic-Adequacy <span style="float: right;"><b>8</b></span>
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Actual Posting      H   3   3S2      Single <div style="display: flex; justify-content: space-around;"> <div><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></div> <div><input type="checkbox"/></div> </div> Recommended Posting From Rating Book <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  SIGNS IN PLACE      at bridge      advance Y or N <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>  LEGIBILITY <input type="checkbox"/> <input type="checkbox"/>	Overhead Signs (attached to bridge) <input type="checkbox"/> yes <input checked="" type="checkbox"/> no  1. Welds <span style="float: right;"><b>NA</b></span> 2. Bolts <span style="float: right;"><b>NA</b></span> 3. Condition <span style="float: right;"><b>NA</b></span>
Item 93b U/W Inspection Date: <b>N/A</b>	

<b>ITEM 61-channel and channel protection</b> <span style="float: right;"><b>7</b></span> 1. channel scour <span style="float: right;"><b>8</b></span> 2. embankment erosion <span style="float: right;"><b>8</b></span> 3. fender system <span style="float: right;"><b>NA</b></span> 4. spur dikes & jetties <span style="float: right;"><b>NA</b></span> 5. rip rap or slope paving <span style="float: right;"><b>NA</b></span> 6. effectiveness <span style="float: right;"><b>NA</b></span> 7. debris <span style="float: right;"><b>7</b></span> 8. vegetation <span style="float: right;"><b>7</b></span>	<b>36-Traffic Safety features</b> <div style="display: flex; justify-content: space-between;"> <div>           1. bridge railing            2. transitions            3. approach guardrail            4. guardrail terminal         </div> <div style="text-align: center;"> <div><b>36</b></div> <div><b>1</b></div> <div><b>1</b></div> <div><b>1</b></div> <div><b>1</b></div> </div> <div style="text-align: center;"> <div>condition</div> <div><b>7</b></div> <div><b>7</b></div> <div><b>6</b></div> <div><b>7</b></div> </div> </div>
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**X=UNKNOWN**
**NA=NOT APPLICABLE**
**IA=INACCESSIBLE**

## NBI Metric Structural Inventory and Appraisal

Date Printed: 09/03/98

(202) Corps of Engineers Structure Number: CEPNEDVT5010002

(8) NBI Structure Number: CEPNEDVT5010002

## Geographic and Route Data

## Dimensional Data

## Inspection Data

(1) State	Vermont	(32) Approach Rdwy Width	4.8 M	(90) Inspection Date (MoYr)	0698
(2) District	00	(39) Navigation Vert Clr	0.0 M	(91) Inspection Frequency	24 Mo
(3) County	000	(40) Navigation Horz Clr	0.0 M	(92) Critical Feature Insp	(93) Date
(4) Place	00000	(48) Max Span Length	0048.8 M	Frac Crit Insp : N	00 /
(6) Feature Under	SPILLWAY CHANNEL	(49) Str Length	00048.8 M	Underwater Insp: N	00 /
(7) Facility on	ACCESS RD	(50) Curb/Sidewalk Width	Left 00.5 M	Other Spec Insp: N	00 /
(9) Location	27.4 KM N OF BRATTLEBORO		Right 00.5 M		
(16) Latitude	43° 01' 12.00"	(51) Brg Rdwy Width, curb-curb	003.8 M		
(17) Longitude	072° 43' 30.00"	(52) Deck Width out-out	004.8 M		
(98) Border Bridge		(53) Min Vert Clr over	99.99 M		
(99) Border Bridge Str No		(54) Min Vert Clr under	N 00.00 M		
(103) Temporary Str		(55) Min Lat Underclr R	N 00.0 M		
		(56) Min Lat Underclr L	99.9 M		

## On and Under Record Data

(112) NBIS Bridge Length	Y
(116) Navigation Min Vert Clr	0.0 M

(5) Inventory Route	Route On	168000000
(10) Min Vert Clr	99.99 M	
(11) Kilometer Point	0000.000	
(19) Detour Length	008 km	
(20) Toll	3	
(26) Func Class	09	
(28) Lanes on/under	0100	
(29) ADT	50	
(30) Year of ADT	1998	
(47) Total Horz Clearance	03.8 M	
(100) Defense Hwy	0	
(101) Parallel Str	N	
(102) Direction of Traffic	3	
(104) Hwy System	0	
(109) Truck Traffic	10%	
(110) Natl Truck Network	No	

## Proposed Improvements

(75) Type of Work	351
(76) Improvement Length	000488 M
(94) Bridge Improv Cost	145
(95) Rdwy Improv Cost	0
(96) Total Proj Cost	145
(97) Year of Cost Est	1998
(114) Future ADT	50
(115) Year of Future ADT	2015

## Condition Rating

(58) Deck	7
(59) Superstructure	6
(60) Substructure	7
(61) Channel & Channel Protect	7
(62) Culverts	N

## General Data

(21) Maintenance Responsibility	70
(22) Owner	70
(31) Design Load	2
(33) Bridge Median	0
(34) Skew	00 deg
(35) Str Flared	No
(37) Hist Significance	5
(38) Navigation Control	N
(42) Type of Service	59
(43) Structure Type Main	309
(44) Structure Type Approach	000
(45) No of Span Main	001
(46) No of Approach Spans	0000
(27) Year Built	1961
(106) Year Reconstructed	0000
(107) Deck Str Type	3
(108) Wear Surf/Protv Sys	000
(111) Nav Pier/Abut Protection	

## Appraisal Rating

(67) Structure Evaluation	5
(68) Deck Geometry	4
(69) Underclrn Vert & Horz	N
(71) Waterway Adequacy	9
(72) Approach Rdwy Alignment	6
(36) Traffic Safety Features	1111
(113) Scour Critical Bridges	8

## Load Rate and Post

(41) Str Open/Post/Close	Open
(64) Operating Rating	23.6 ton
(66) Inventory Rating	17.2 ton
(70) Bridge Posting	5

## Over 200 Items

(200) COE MSC	CENAD
(201) COE District	CENAE
(202) Structure Number	CEPNEDVT5010002
(203) Inspection Office	EPDG
(204) Inspector	JOE COLUCCI
(205) Inspection Cost	009000
(206) Cooper's Loading	
(207) Railroad Stru Number	
(208) Name of Railroad	
(209) Recommended Speed Limit	
(210) Posted Speed Limit (KPH)	
(211) MACOM	
(212) Installation Name	
(213) Military Wheel Load Class	
(214) Military Truck Load Class	
(215) Installation Number	
(216) Seismic Category	
(217) Acceleration Coefficient	0.00
(218) Soil Site Coefficient	0.0

Sufficiency Rating = 062.7

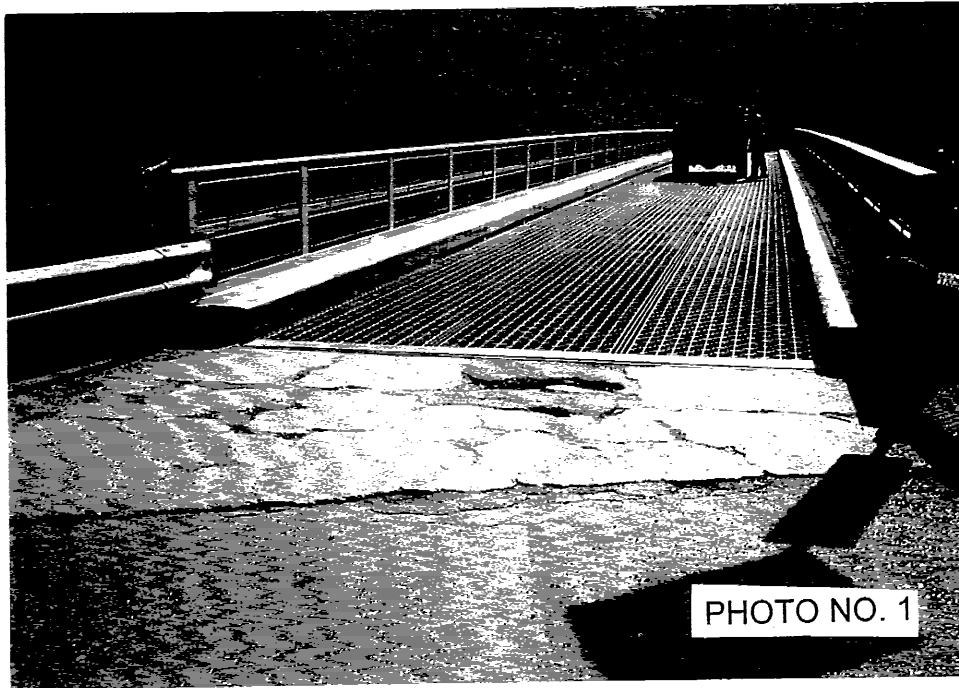


Photo 1 - East Approach; Note extensive deterioration of approach slab.

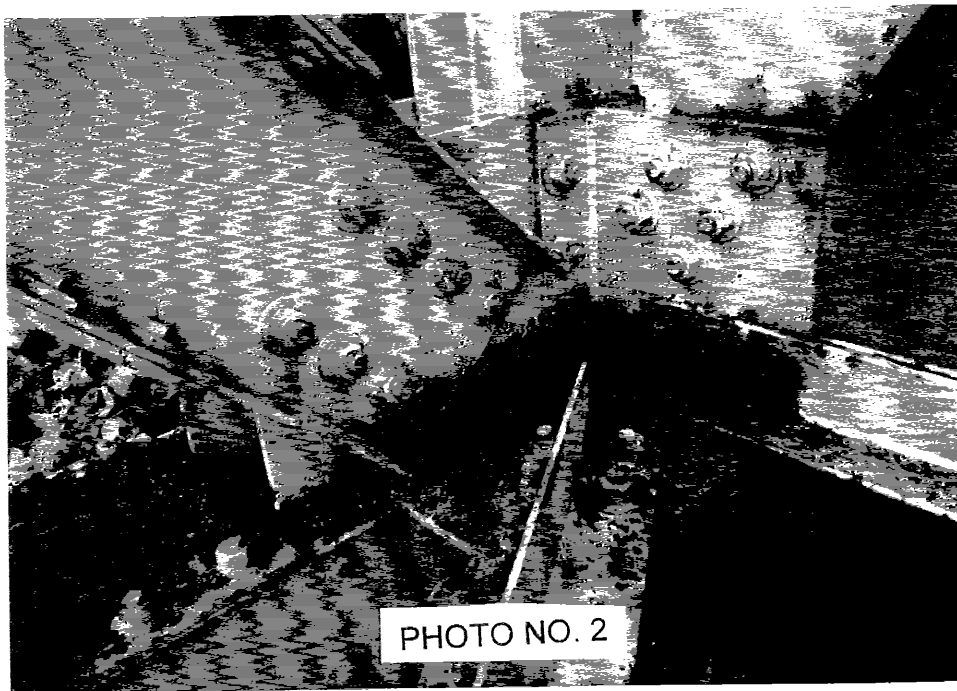


Photo 2 - Lower truss connection above northeast bearing; Note extensive build-up of debris and corrosion.

NORTH SPRINGFIELD LAKE  
SPILLWAY BRIDGE  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION: 27 JUNE, 98

DATE OF PREVIOUS INSPECTIONS: Routine Inspection, 11 Sep 96  
Routine Inspection, 16 Aug 94  
Routine Inspection, 24 Sep 92  
Routine Inspection, 25 Jul 90.  
Inventory Inspection, 21 May 84.

BRIDGE DESCRIPTION AND HISTORY

The spillway bridge at North Springfield Lake, originally constructed in 1960 (rehabbed in 1988 and 1994), is a single span welded plate girder structure, with a span length of 150'-0" center to center of bearings. The roadway width is 12'-0" between curbs, with a 2'-2" wide 10" high walkway on each side supporting the 3'-4" high (3 pipe) bridge rail system. The reinforced concrete deck varies in thickness from 7 1/4" at the gutter to 8 1/4" at the centerline and is supported by two 90" welded plate girders spaced at 12'-0" on center. Diaphragms and cross bracing are located at 18'-9" on center, and the bottom flanges are laterally braced. Between girders, along the longitudinal centerline, an 18" deep longitudinal stringer frames into the diaphragms. All field connections are high strength bolts, and shop connections are rivets. Two electric ducts are carried beneath the north fascia and a 1 1/2" water line is carried beneath the deck.

The east abutment is a stub type with concrete cap, back wall and wing walls, all founded on rock. The west abutment is built integrally with the upper portion of the west spillway wall which extends approximately 137 feet and retains the west approach span. The west approach span consists of 6 variable length monoliths which curve on a sharp horizontal radius.

In 1988 the bridge was rehabilitated, replacing the existing deck with a new deck 1 inch thicker. A second rehab was performed in August, 1994, placing a new 1 1/2" fiber reinforced concrete overlay on the deck and the approach span, adding another additional inch of thickness to the deck. (Surface preparation removed 1/2 inch prior to overlay).

#### D. Substructure

Overall condition is good. There is a minor spall in the Northeast corner of the east abutment back wall. Some hairline cracks are present around the anchor bolts in the west abutment seat. There is a 5' X 1' concrete spall at the north side of the west abutment, below the bridge seat in the spillway wall near the spillway weir. Several construction joints at the north side of the west abutment spillway walls show some minor concrete deterioration and moderate efflorescence.

E. Condition Rating	Inventory 1984:	6
	Routine 1990:	7
	Routine 1992:	7
	Routine 1994:	7
	Routine 1996:	7
	Routine 1998:	7

#### RECOMMENDATIONS

1. Tighten all loose bolts noted during the inspection. This should be performed during the next routine inspection (June 2000), by inspection and/or project personnel.



# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/state <u>Springfield VT.</u>		bridge dept. no. <u>COE</u>	8-structure no. <u>CEPNE VT 5010003</u>	90-date inspected <u>6/27/98</u>
2-dist. <u>104-highway system</u> <u>Ø - NOT ON NHS</u>	22-owner <u>70 COE</u>	27-year built <u>1963</u>	106-year rebuilt <u>NA</u>	11-milepoint <u>—</u>
43-structure type <u>302 Single span Welded plate Girder</u>		quality control engineer <u>NICK FORBES</u>		
07-facility carried <u>No Springfield Dam Flood Flood</u>		team leader <u>JOE COLUCCI</u>		
06-features intersected <u>Spillway Channel</u>		team members <u>Ed Mills</u>		

item 58	<span style="border: 1px solid black; padding: 2px;">7</span>
<b>DECK</b>	
1. Wearing Surface	<span style="border: 1px solid black; padding: 2px;">8</span>
2. Deck-Condition	<span style="border: 1px solid black; padding: 2px;">8</span>
3. Stay in Place Forms	<span style="border: 1px solid black; padding: 2px;">8</span>
4. Curbs	<span style="border: 1px solid black; padding: 2px;">7</span>
5. Median	<span style="border: 1px solid black; padding: 2px;">NA</span>
6. Sidewalks	<span style="border: 1px solid black; padding: 2px;">NA</span>
7. Parapet	<span style="border: 1px solid black; padding: 2px;">NA</span>
8. Railing	<span style="border: 1px solid black; padding: 2px;">7</span>
Anti Missile Fence	<span style="border: 1px solid black; padding: 2px;">NA</span>
9. Drains	<span style="border: 1px solid black; padding: 2px;">8</span>
11. Lighting Standards	<span style="border: 1px solid black; padding: 2px;">NA</span>
12. Utilities	<span style="border: 1px solid black; padding: 2px;">8</span>
13. Deck Joints	<span style="border: 1px solid black; padding: 2px;">7</span>
14. Approach Settlement	<span style="border: 1px solid black; padding: 2px;">7</span>

item 59	<span style="border: 1px solid black; padding: 2px;">7</span>
<b>SUPERSTRUCTURE</b>	
1. Bearing Devices	<span style="border: 1px solid black; padding: 2px;">7</span>
2. Stringers	<span style="border: 1px solid black; padding: 2px;">7</span>
3. Diaphragms	<span style="border: 1px solid black; padding: 2px;">7</span>
4. Girders or Beams	<span style="border: 1px solid black; padding: 2px;">7</span>
5. Floor Beams	<span style="border: 1px solid black; padding: 2px;">7</span>
6. Trusses	<span style="border: 1px solid black; padding: 2px;">NA</span>
7. Rivets or Bolts	<span style="border: 1px solid black; padding: 2px;">7</span>
8. Welds	<span style="border: 1px solid black; padding: 2px;">7</span>
9. Collision Damage	<span style="border: 1px solid black; padding: 2px;">NA</span>
10. Load Deflection	<span style="border: 1px solid black; padding: 2px;">8</span>
11. Member Alignment	<span style="border: 1px solid black; padding: 2px;">7</span>
12. Load Vibration	<span style="border: 1px solid black; padding: 2px;">8</span>
13. Paint-Epoxy	<span style="border: 1px solid black; padding: 2px;">7</span>
14. Year Painted	<span style="border: 1px solid black; padding: 2px;">89</span>
15. Under Clearance <u>NA</u> ft _____ in	
Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	

item 60	<span style="border: 1px solid black; padding: 2px;">7</span>
<b>SUBSTRUCTURE</b>	
1. Abutments	
a-Wings	<span style="border: 1px solid black; padding: 2px;">7</span>
b-Backwall	<span style="border: 1px solid black; padding: 2px;">7</span>
c-Bridge Seats	<span style="border: 1px solid black; padding: 2px;">7</span>
d-Breastwall	<span style="border: 1px solid black; padding: 2px;">7</span>
e-Footings	<span style="border: 1px solid black; padding: 2px;">NA</span>
f-Piles	<span style="border: 1px solid black; padding: 2px;">NA</span>
g-Erosion	<span style="border: 1px solid black; padding: 2px;">8</span>
h-Settlement	<span style="border: 1px solid black; padding: 2px;">8</span>
2. Piers or Bents	
a-Caps	<span style="border: 1px solid black; padding: 2px;">NA</span>
b-Column	<span style="border: 1px solid black; padding: 2px;">NA</span>
c-Web	<span style="border: 1px solid black; padding: 2px;">NA</span>
d-Footing	<span style="border: 1px solid black; padding: 2px;">NA</span>
e-Piles	<span style="border: 1px solid black; padding: 2px;">NA</span>
f-Scour	<span style="border: 1px solid black; padding: 2px;">NA</span>
g-Settlement	<span style="border: 1px solid black; padding: 2px;">NA</span>
3. Collision Damage	<span style="border: 1px solid black; padding: 2px;">8</span>
4. Hydraulic-Adequacy	<span style="border: 1px solid black; padding: 2px;">8</span>

Actual Posting	H 3 3S2	Single
	<span style="border: 1px solid black; padding: 2px;">NA</span> <span style="border: 1px solid black; padding: 2px;">NA</span> <span style="border: 1px solid black; padding: 2px;">NA</span>	<span style="border: 1px solid black; padding: 2px;">NA</span>
Recommended Posting From Rating Book	<span style="border: 1px solid black; padding: 2px;">NA</span> <span style="border: 1px solid black; padding: 2px;">NA</span> <span style="border: 1px solid black; padding: 2px;">NA</span>	<span style="border: 1px solid black; padding: 2px;">NA</span>
SIGNS IN PLACE	at bridge	advance
Y or N	<span style="border: 1px solid black; padding: 2px;">N</span>	<span style="border: 1px solid black; padding: 2px;">N</span>
LEGIBILITY	<span style="border: 1px solid black; padding: 2px;">NA</span>	<span style="border: 1px solid black; padding: 2px;">NA</span>

Overhead Signs (attached to bridge)

☐ yes ☒ no

1. Welds

NA

2. Bolts

NA

3. Condition

NA

Item 93b U/W Inspection Date: NA

ITEM 61-channel and channel protection

8

channel scour

8

5. rip rap or slope paving

NA

mbankment erosion

8

6. effectiveness

NA

3. fender system

NA

7. debris

8

4. spur dikes & jetties

NA

8. vegetation

8

36-Traffic Safety features

36

condition

1. bridge railing

7

7

2. transitions

7

7

3. approach guardrail

7

7

4. guardrail terminal

7

7

**X=UNKNOWN**

**NA=NOT APPLICABLE**

**IA=INACCESSIBLE**

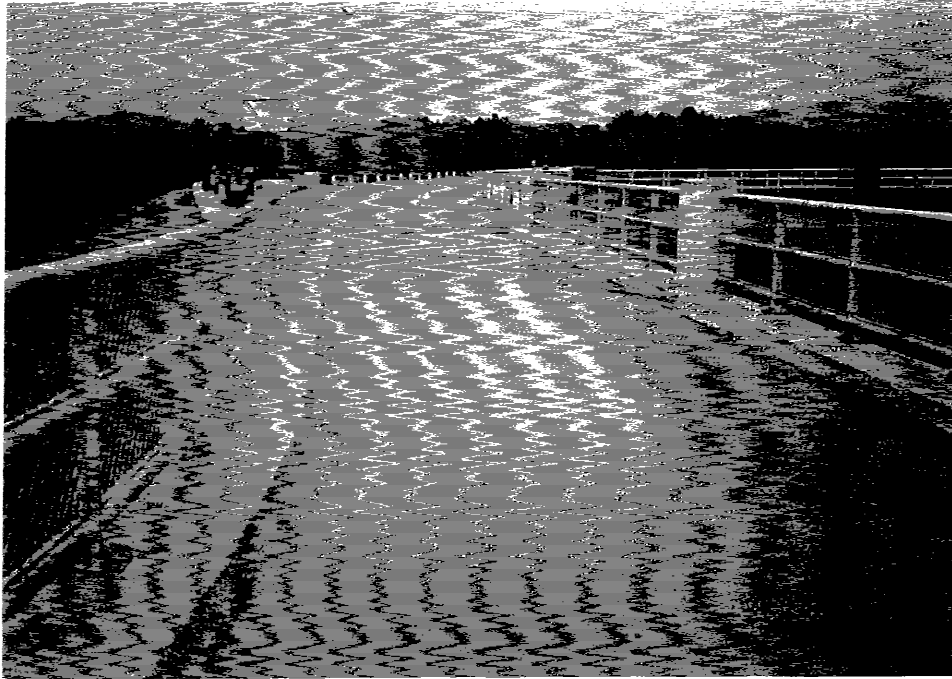


PHOTO NO. 1  
WEST END AND APPROACH TO BRIDGE

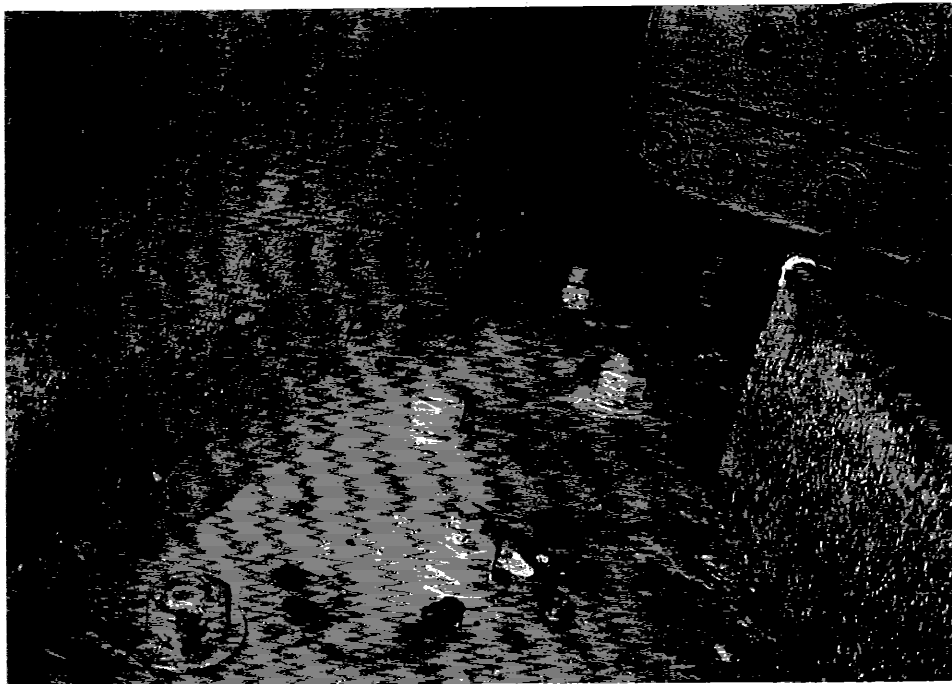


PHOTO NO. 2  
IMPACTED RUST AND BUCKLING AT LOWER LATERAL  
BRACING GUSSETS ABOVE SOUTH WEST BEARING

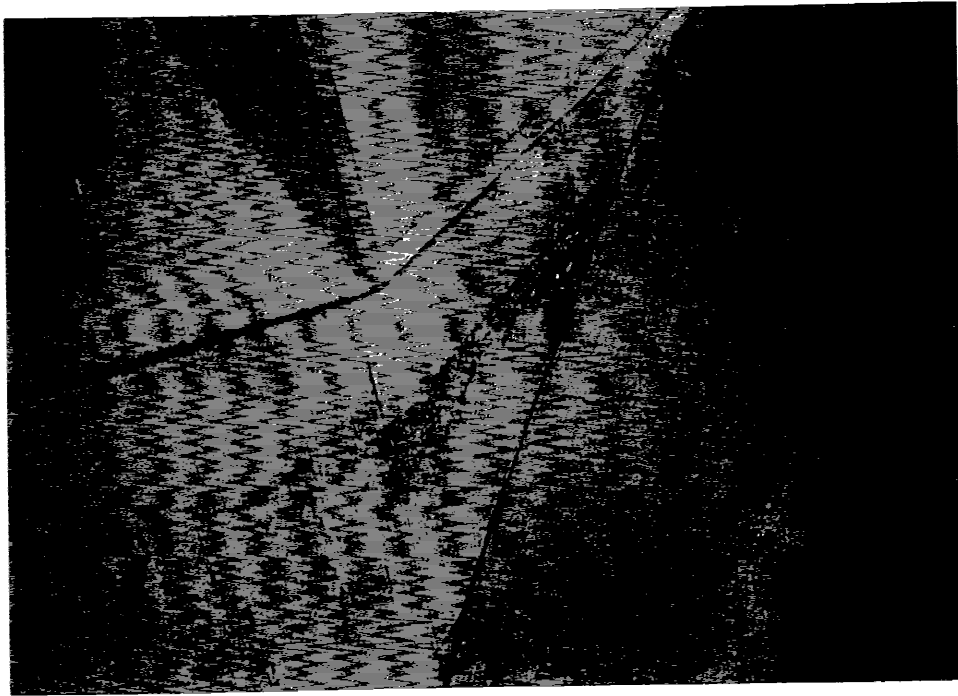


PHOTO NO. 3  
MODERATE SPALL IN SPILLWAY WALL BELOW NORTHWEST ABUTMENT SEATS

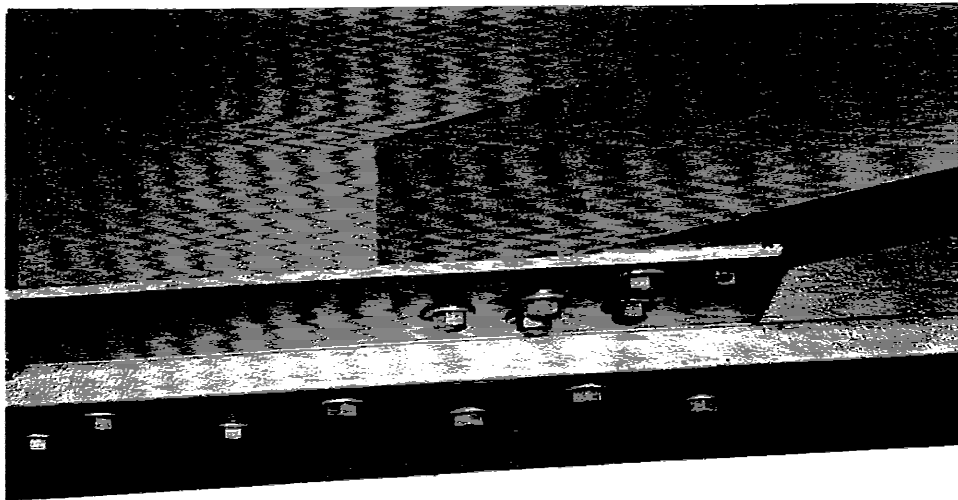


PHOTO NO. 4  
LOOSE WASHERS AND BOLTS IN LATERAL BRACING

UNION VILLAGE DAM  
OLD ROUTE 132 BRIDGE  
THETFORD, VT  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

25 August 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection, 16 May 96  
Routine Inspection, 1 June 94  
Routine Inspection, 22 Sept 92  
Routine Inspection, 26 July 90  
Routine Inspection, 28 July 88  
Inventory Inspection, 21 Sept 84

RATING (T=TONS)

Type	Inventory	Operating	Comments
H	6T	10T	All components have some section loss which remains within the assumptions used in the 1984 ratings (10% interior beams, 20% exterior beams)
3	8T	13T	
3S2	10T	17T	
3-3	14T	22T	

BRIDGE DESCRIPTION AND HISTORY

This structure carries Old Vermont Route 132 over the West Branch of the Ompompanoosuc River, upstream from Union Village Dam in Thetford Hill, VT. It provides access to the Union Village Dam reservoir area. No record plans were available for this bridge; field measurements were taken during the inventory inspection to provide sufficient information for the rating analysis. Details of those field measurements are included in Appendix C of the inventory inspection.

The structure is a single span steel rolled beam bridge with a length of 54'-8" center to center of end bearing plates. The clear span, face to face of abutments, varies from 49'-10" on the north side, to 47'-10" on the south side. The main girders are skewed approximately 16 degrees from the perpendicular to the axis of the river. Six W21 x 55 rolled wide flange beams serve as main beams; four interior at 3'-4" center to center and two exterior at 4'-0" from interior beams. Five C15 x 13.9 channels serve as mid-span

of erosion. Debris was noted on both concrete bridge seats. A previously patched area at the west edge of the north breastwall exhibits minor delamination and efflorescence.

#### E. Channel

Channel alignment is fair to good. The stream flows slightly towards the south abutment. The south abutment is adequately protected by stone located at the base of the abutment although exposed concrete at and above the water line shows abrasion. A deep area exists at the upstream edge of the south abutment just beyond the stone protecting the base. Debris has accumulated at the upstream south rubble stone training wall. The upstream and downstream channel is wider than the opening at the abutments, indicating insufficient width at the bridge.

<u>CONDITION RATING</u>	Routine, 1998	8
	Routine, 1996	8
	Routine, 1994	8
	Routine, 1992	8
	Routine, 1990	4/5
	Routine, 1988	5
	Inventory, 1984	5

#### RECOMMENDATIONS

##### STATUS OF PREVIOUS RECOMMENDATIONS

Regrade approaches and cut vegetation at approaches and around guardrails as required.

Maintained by project personnel.

##### REVISED RECOMMENDATIONS

Same as above.

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <b>Thetford VT</b>	bridge dept. no. <b>-</b>	8-structure no. <b>CEPNED VT 5010004</b>	90-date inspected <b>25 August 98</b>
104-highway system <b>8 Non Federal Aid</b>	22-owner <b>USACE</b>	27-year built <b>1920 ±</b>	106-year rebuilt <b>-</b>
43-structure type <b>303 - Steel Girder</b>		quality control engineer <b>Nick Forbes</b>	
07-facility carried <b>Reservoir Area Access Road</b>		team leader <b>Joe Colucci</b>	
06-features intersected <b>Ompempancosuc River</b>		team members <b>Laureen Borschaner, Jenn Lee</b>	

<b>item 58</b> <span style="float: right; border: 1px solid black; padding: 2px;">7</span> <b>DECK</b> 1. Wearing Surface <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 2. Deck-Condition <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 3. Stay in Place Forms <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 4. Curbs <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 5. Median <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 6. Sidewalks <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 7. Parapet <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 8. Railing <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 9. Anti Missile Fence <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 10. Drains <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 11. Lighting Standards <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 12. Utilities <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 13. Deck Joints <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 14. Approach Settlement <span style="float: right; border: 1px solid black; padding: 2px;">7</span>	<b>item 59</b> <span style="float: right; border: 1px solid black; padding: 2px;">7</span> <b>SUPERSTRUCTURE</b> 1. Bearing Devices <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 2. Stringers <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 3. Diaphragms <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 4. Girders or Beams <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 5. Floor Beams <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 6. Trusses <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 7. Rivets or Bolts <span style="float: right; border: 1px solid black; padding: 2px;">7</span> 8. Welds <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 9. Collision Damage <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 10. Load Deflection <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 11. Member Alignment <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 12. Load Vibration <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 13. Paint-Epoxy <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 14. Year Painted <span style="float: right; border: 1px solid black; padding: 2px;">1992</span> 15. Under Clearance _____ ft _____ in Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<b>item 60</b> <span style="float: right; border: 1px solid black; padding: 2px;">8</span> <b>SUBSTRUCTURE</b> 1. Abutments a-Wings <span style="float: right; border: 1px solid black; padding: 2px;">8</span> b-Backwall <span style="float: right; border: 1px solid black; padding: 2px;">8</span> c-Bridge Seats <span style="float: right; border: 1px solid black; padding: 2px;">7</span> d-Breastwall <span style="float: right; border: 1px solid black; padding: 2px;">7</span> e-Footings <span style="float: right; border: 1px solid black; padding: 2px;">IA</span> f-Piles <span style="float: right; border: 1px solid black; padding: 2px;">N</span> g-Erosion <span style="float: right; border: 1px solid black; padding: 2px;">8</span> h-Settlement <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 2. Piers or Bents a-Caps <span style="float: right; border: 1px solid black; padding: 2px;">N</span> b-Column <span style="float: right; border: 1px solid black; padding: 2px;">N</span> c-Web <span style="float: right; border: 1px solid black; padding: 2px;">N</span> d-Footing <span style="float: right; border: 1px solid black; padding: 2px;">N</span> e-Piles <span style="float: right; border: 1px solid black; padding: 2px;">N</span> f-Scour <span style="float: right; border: 1px solid black; padding: 2px;">N</span> g-Settlement <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 3. Collision Damage <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 4. Hydraulic-Adequacy <span style="float: right; border: 1px solid black; padding: 2px;">8</span>
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Actual Posting      H    3    3S2      Single <span style="border: 1px solid black; padding: 2px;">6</span> <span style="border: 1px solid black; padding: 2px;"></span> <span style="border: 1px solid black; padding: 2px;"></span> <span style="border: 1px solid black; padding: 2px;"></span> Recommended Posting From Rating Book <span style="border: 1px solid black; padding: 2px;">6</span> <span style="border: 1px solid black; padding: 2px;">8</span> <span style="border: 1px solid black; padding: 2px;">10</span> <span style="border: 1px solid black; padding: 2px;"></span> SIGNS IN PLACE      at bridge      advance Y or N <span style="border: 1px solid black; padding: 2px;">N</span> <span style="border: 1px solid black; padding: 2px;">N</span> LEGIBILITY <span style="border: 1px solid black; padding: 2px;"></span> <span style="border: 1px solid black; padding: 2px;"></span>	Overhead Signs (attached to bridge) <input type="checkbox"/> yes <input checked="" type="checkbox"/> no 1. Welds <span style="border: 1px solid black; padding: 2px;"></span> 2. Bolts <span style="border: 1px solid black; padding: 2px;"></span> 3. Condition <span style="border: 1px solid black; padding: 2px;"></span> Item93b U/W Inspection Date: _____
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<b>ITEM 61-channel and channel protection</b> <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 1. channel scour <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 2. embankment erosion <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 3. fender system <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 4. spur dikes & jetties <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 5. rip rap or slope paving <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 6. effectiveness <span style="float: right; border: 1px solid black; padding: 2px;">N</span> 7. debris <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 8. vegetation <span style="float: right; border: 1px solid black; padding: 2px;">8</span>	<b>36-Traffic Safety features</b> 36      condition 1. bridge railing <span style="float: right; border: 1px solid black; padding: 2px;">0</span> <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 2. transitions <span style="float: right; border: 1px solid black; padding: 2px;">1</span> <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 3. approach guardrail <span style="float: right; border: 1px solid black; padding: 2px;">1</span> <span style="float: right; border: 1px solid black; padding: 2px;">8</span> 4. guardrail terminal <span style="float: right; border: 1px solid black; padding: 2px;">0</span> <span style="float: right; border: 1px solid black; padding: 2px;">8</span>
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PROJECT: Union Village Dam  
 BRIDGE: Old Route 132  
 LOCATION: Thetford VT

BRIDGE INSPECTION  
SCOUR CHECKLIST

1. Is the bridge currently experiencing, or does it have a history of, scour activity? yes
2. Is the streambed erodible? If so, does the structure have any vulnerable design features? yes
  - a. Piers, abutments with spread footings or short pile foundations. yes
  - b. Superstructure with simple spans or non-redundant support systems. yes
  - c. Inadequate waterway openings. yes
  - d. Designs which collect ice and debris. no
  - e. All water must pass through or over structure. yes
  - f. Other. -
3. Are any characteristics of an aggressive stream or waterway present? yes
  - a. Active degradation or aggradation of streambed. yes
  - b. Significant lateral movement or erosion of streambanks. no
  - c. Steep slopes. no
  - d. High velocities. no
  - e. Any history of highway or bridge damage during past floods. yes
  - f. Other. -
4. Is the bridge located on a stream reach with any adverse flow characteristics? no
  - a. Crossing near stream confluence. no
  - b. Crossing of tributary stream near confluence with larger streams. no
  - c. Crossing on sharp bend in stream. no
  - d. Location on alluvial fan. no
  - e. Other. -
5. Other comments or observations. -

NBI Metric Structural Inventory and Appraisal

Date Printed: 09/02/98

(202) Corps of Engineers Structure Number: CEPNEDVT5010004

(8) NBI Structure Number: CEPNEDVT5010004

Geographic and Route Data

Dimensional Data

Inspection Data

(1) State Vermont  
(2) District 00  
(3) County 000  
(4) Place 00000  
(6) Feature Under OMPOMPANOOSUC RIVER  
(7) Facility on RES ACCESS RD  
(9) Location 20.92 KM N OF WHITE RIVER  
(16) Latitude 43° 46' 12.00"  
(17) Longitude 072° 15' 30.00"  
(98) Border Bridge  
(99) Border Bridge Str No  
(103) Temporary Str

(32) Approach Rdwy Width 5.6 M  
(39) Navigation Vert Clr 0.0 M  
(40) Navigation Horz Clr 0.0 M  
(48) Max Span Length 0015.2 M  
(49) Str Length 00016.7 M  
(50) Curb/Sidewalk Width Left 00.2 M  
Right 00.2 M  
(51) Brg Rdwy Width, curb-curb 005.6 M  
(52) Deck Width out-out 006.0 M  
(53) Min Vert Clr over 99.99 M  
(54) Min Vert Clr under N 00.00 M  
(55) Min Lat Underclr R N 00.0 M  
(56) Min Lat Underclr L 99.9 M  
(112) NBIS Bridge Length Y  
(116) Navigation Min Vert Clr 0.0 M

(90) Inspection Date (MoYr) 0898  
(91) Inspection Frequency 24 Mo  
(92) Critical Feature Insp (93) Date  
Frac Crit Insp : N 00 /  
Underwater Insp: N 00 /  
Other Spec Insp: N 00 /

On and Under Record Data

Route On  
(5) Inventory Route 168000000  
(10) Min Vert Clr 99.99 M  
(11) Kilometer Point 0000.000  
(19) Detour Length 199 km  
(20) Toll 3  
(26) Func Class 09  
(28) Lanes on/under 0100  
(29) ADT 10  
(30) Year of ADT 1998  
(47) Total Horz Clearance 05.6 M  
(100) Defense Hwy 0  
(101) Parallel Str N  
(102) Direction of Traffic 3  
(104) Hwy System 0  
(109) Truck Traffic 00%  
(110) Natl Truck Network No

Proposed Improvements  
(75) Type of Work 000  
(76) Improvement Length 000000 M  
(94) Bridge Improv Cost 0  
(95) Rdwy Improv Cost 0  
(96) Total Proj Cost 0  
(97) Year of Cost Est 0000  
(114) Future ADT 10  
(115) Year of Future ADT 2015

Condition Rating  
(58) Deck 7  
(59) Superstructure 7  
(60) Substructure 8  
(61) Channel & Channel Protect 8  
(62) Culverts N

General Data

Appraisal Rating

(21) Maintenance Responsibility 70  
(22) Owner 70  
(31) Design Load 1  
(33) Bridge Median 0  
(34) Skew 16 deg  
(35) Str Flared No  
(37) Hist Significance 5  
(38) Navigation Control 0  
(42) Type of Service 55  
(43) Structure Type Main 303  
(44) Structure Type Approach 000  
(45) No of Span Main 001  
(46) No of Approach Spans 0000  
(27) Year Built 1925  
(106) Year Reconstructed 0000  
(107) Deck Str Type 3  
(108) Wear Surf/Protv Sys 000  
(111) Nav Pier/Abut Protection 1

(67) Structure Evaluation 3  
(68) Deck Geometry 4  
(69) Underclrn Vert & Horz N  
(71) Waterway Adequacy 9  
(72) Approach Rdwy Alignment 6  
(36) Traffic Safety Features 0110  
(113) Scour Critical Bridges 7

Load Rate and Post

(41) Str Open/Post/Close Open  
(64) Operating Rating 09.1 ton  
(66) Inventory Rating 05.4 ton  
(70) Bridge Posting 5

Over 200 Items

(200) COE MSC CENAD  
(201) COE District CENAE  
(202) Structure Number CEPNEDVT5010004  
(203) Inspection Office EPDG  
(204) Inspector JOE COLUCCI  
(205) Inspection Cost 007000  
(206) Cooper's Loading  
(207) Railroad Stru Number  
(208) Name of Railroad  
(209) Recommended Speed Limit  
(210) Posted Speed Limit (KPH)  
(211) MACOM  
(212) Installation Name  
(213) Military Wheel Load Class  
(214) Military Truck Load Class  
(215) Installation Number  
(216) Seismic Category  
(217) Acceleration Coefficient 0.00  
(218) Soil Site Coefficient 0.0

Sufficiency Rating = 048.1  
Functionally Obsolete





PHOTO NO. 1  
VEGETATION AT NORTH APPROACH

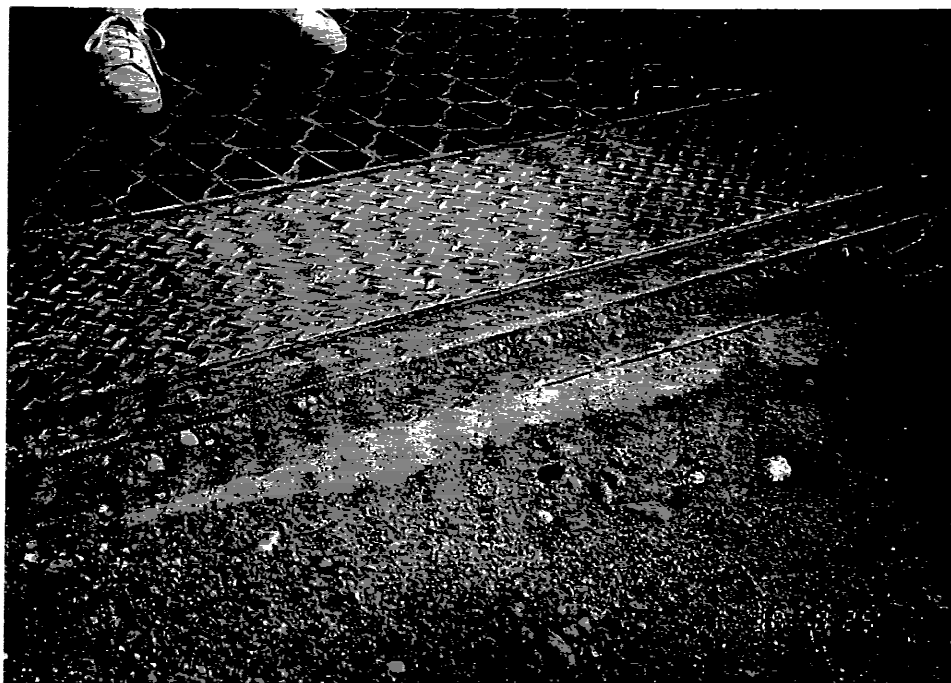


PHOTO NO. 2  
TRANSITION AT SOUTH APPROACH

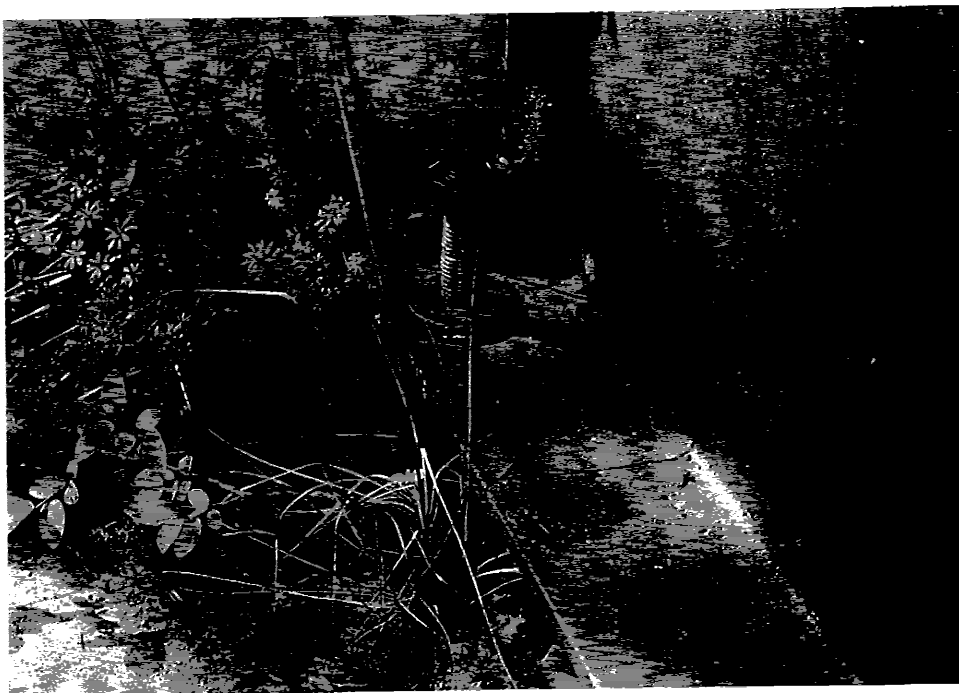


PHOTO NO. 3  
BOLT AT SOUTHEAST BRIDGE BEARING

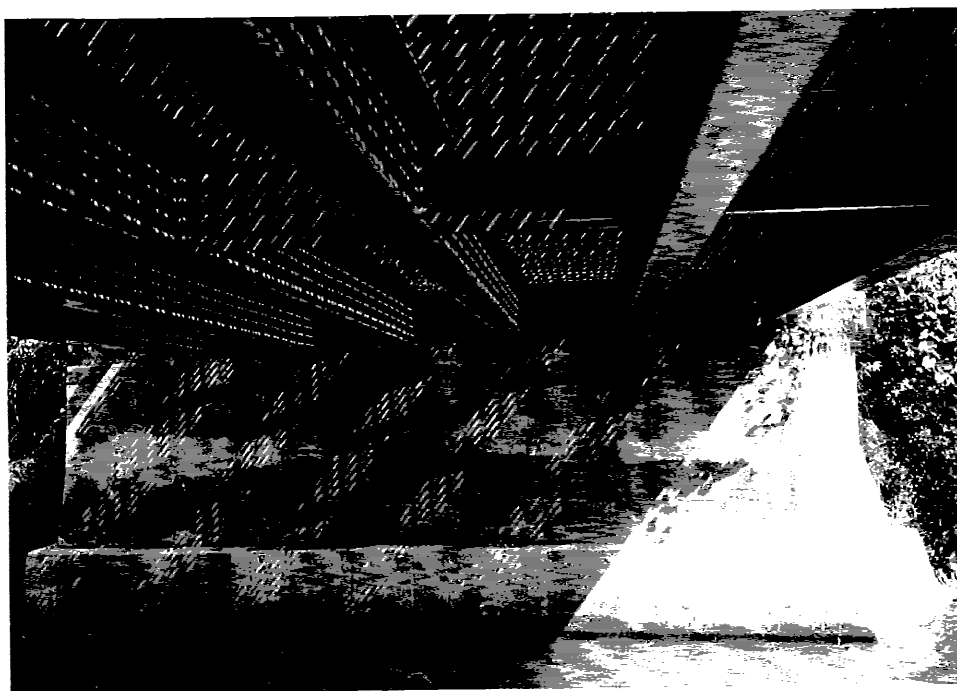


PHOTO NO. 4  
DELAMINATION AND EFFLORESCENCE AT NORTH ABUTMENT

BALL MOUNTAIN LAKE  
SLASON BRIDGE  
LONDONDERRY, VT  
FISCAL YEAR 1998  
ROUTINE INSPECTION REPORT

DATE OF ROUTINE INSPECTION

25 August 1998

DATES OF PREVIOUS INSPECTIONS

Routine Inspection, 7 Aug 96  
Routine Inspection, 3 June 94  
Routine Inspection, 23 Sept 92  
Routine Inspection, 10 May 90  
Routine Inspection, 24 Aug 88  
Inventory Inspection, 22 May 84

RATING (T=TONS)

Type	Inventory	Operating	Comments
H	9T	12T	No change due to inspection findings.
3	15T	22T	
3S2	24T	34T	
3-3	29T	42T	

BRIDGE DESCRIPTION AND HISTORY

The bridge provides access over the Winhall River, into the Winhall Recreation Area, located in Londonderry, VT, upstream from Ball Mountain Lake. The structure is a single span Warren low truss built in 1928. The span length is 90'-0" center to center of the bearings. The bearings at the north end are elastomeric expansion bearings. The south end bearings are fixed in place.

The deck width is 10'-5 1/2" between 9" wide by 10 1/2" high timber brush blocks. The railings on both sides consist of 3'-6" high steel angles attached to the inside of the truss. The deck consists of 3 1/2" by 9 1/2" transverse timbers (12' long) supported on five stringers spaced at 2'-8" center to center. The stringers frame into steel floor beams spaced at 18'-0", which frame into the bottom chords. Overall, the width is 13'-4 1/2" center to center of the trusses.

The abutments appear to be stub type concrete abutments with backwalls that extend to the road surface. Wingwalls on both sides flare away from the deck towards the roadway.

## EVALUATION

### A. Approach Roadway

Both approaches are in good condition. Bituminous paving was replaced in FY 96 at the north approach. There is a 1/4 to 1/2 inch depression at the interface between the pavement and the backwall. The south approach gravel roadway is well-graded. The moderately abraded backwall of the abutment is visible at the south approach. The top of the north abutment backwall received a concrete overlay in FY 96 and is in good condition.

The approach alignment at the north end is poor. Vehicles are required to take a nearly 90 degree turn to enter the narrow bridge deck. The steel bridge rail and timber curb were previously damaged at the northeast entrance by a vehicle which unsuccessfully negotiated the turn. The approach angle at the south deck entrance is also poor. Vehicles may take a sharp 90 degree turn to enter the deck or may reposition on an adjacent gravel road to enter the deck from a more direct angle. The gravel roadway limits the speed on the south approach.

Rails at the timber post and guardrail system at the northwest approach are in good condition. Two rails appear to have been hit and slightly damaged. There are no guardrails at the three remaining approach sides. There are no load rating or speed limit postings at the bridge.

### B. Deck

The timber deck is in good condition with moderate wear evident at the upper surface of the timbers. The steel deck railing was painted in FY 96 and is in good condition. The rail was hit in the past and remains slightly bent outward at the east side of the north approach. Minor scrapes in the paint from more recent collisions were evident at the northeast and northwest bridge rails. Three timber curb anchor nuts are missing and one nut is loosely threaded on the east side of the bridge. Three bolts at the northeast curb are bent. One nut is loose at the west side of the timber curb. A wooden cribbing block underlying the curb has split in half at the southeast end of the bridge.

### C. Superstructure

The superstructure is in good condition. All steel surfaces were recently painted and are in good condition. Steel members under the bridge are pitted due to corrosion that was mitigated during the FY 96 painting contract. The tops of steel stringers where they adjoin the timber deck weren't painted. Staining has occurred at the timber/steel stringer connection where water is able to seep through the timber deck onto the stringers below. Minor staining and corrosion is evident at the top and bottom flanges of the stringers and at several bolts anchoring gusset plates at panel points along the trusses.

### D. Substructure

The north and south abutments and wingwalls are in good condition. Cracks and spalls were repaired during the FY 96 contract. The backwall of the south abutment is abraded, as previously noted. The bridge seats have moderate debris. Bearings at the south bridge seat have minor rusting due to the debris buildup. Bearings at the north seat are in good condition. The elastomeric pads of the expansion bearings were painted over during the recent contract and the paint has begun to peel off. Bearings at the two outside stringers at the north bridge seat are bolted into the concrete seat on one side of the bearing only.

### E. Channel

The channel alignment is good on the downstream side. The upstream channel curves 90 degrees to the south approximately 100 feet upstream of the bridge. Two large sand and gravel shoals exist, one directly at the south upstream edge of the bridge and the other at the north downstream side. There is no indication of a scour problem at the bridge. A geotechnical bridge scour assessment completed in September 1994 indicates little potential for scour due to the coarse stream bed and bank material.

#### CONDITION RATING

Routine, 1998	8
Routine, 1996	8
Routine, 1994	6
Routine, 1992	6
Routine, 1990	7
Inventory, 1984	7

## RECOMMENDATIONS

### STATUS OF PREVIOUS RECOMMENDATIONS

Replace missing bolts and tighten loose nuts at timber curb.

Not Completed

### REVISED RECOMMENDATIONS

Project personnel to implement previous recommendation. New timber cribbing block to be installed under the southeast bridge curb.

Fund preliminary engineering and cost analysis to evaluate the feasibility of modifying north and south bridge approaches to improve bridge access for large recreational vehicles.

Estimated Cost: \$15,000

# STRUCTURES INSPECTION FIELD REPORT

## ROUTINE INSPECTION

city/town <u>Londonderry VT</u>	bridge dept. no. <u>-</u>	8-structure no. <u>CEPNEDVT 5C10001</u>	90-date inspected <u>25 August 98</u>
104-highway system <u>8 New Federal Aid</u>	22-owner <u>USACE</u>	27-year built <u>1928</u>	106-year rebuilt <u>-</u>
43-structure type <u>310 - Steel Through Truss</u>		quality control engineer <u>Nick Forbes</u>	
07-facility carried <u>Access Rd. - Winhall Brook Recreation Area</u>		team leader <u>Joe Colucci</u>	
06-features intersected <u>Winhall River</u>		team members <u>Laureen Berchaner, Jenn Lee</u>	

<p>item 58 <span style="float: right;">7</span></p> <p>DECK</p> <table style="width: 100%;"> <tr><td>1. Wearing Surface</td><td style="text-align: center;">N</td></tr> <tr><td>2. Deck-Condition</td><td style="text-align: center;">7</td></tr> <tr><td>3. Stay in Place Forms</td><td style="text-align: center;">N</td></tr> <tr><td>4. Curbs</td><td style="text-align: center;">6</td></tr> <tr><td>5. Median</td><td style="text-align: center;">N</td></tr> <tr><td>6. Sidewalks</td><td style="text-align: center;">N</td></tr> <tr><td>7. Parapet</td><td style="text-align: center;">N</td></tr> <tr><td>8. Railing</td><td style="text-align: center;">6</td></tr> <tr><td>9. Anti Missile Fence</td><td style="text-align: center;">N</td></tr> <tr><td>10. Drains</td><td style="text-align: center;">N</td></tr> <tr><td>11. Lighting Standards</td><td style="text-align: center;">N</td></tr> <tr><td>12. Utilities</td><td style="text-align: center;">N</td></tr> <tr><td>13. Deck Joints</td><td style="text-align: center;">N</td></tr> <tr><td>14. Approach Settlement</td><td style="text-align: center;">7</td></tr> </table>	1. Wearing Surface	N	2. Deck-Condition	7	3. Stay in Place Forms	N	4. Curbs	6	5. Median	N	6. Sidewalks	N	7. Parapet	N	8. Railing	6	9. Anti Missile Fence	N	10. Drains	N	11. Lighting Standards	N	12. Utilities	N	13. Deck Joints	N	14. Approach Settlement	7	<p>item 59 <span style="float: right;">8</span></p> <p>SUPERSTRUCTURE</p> <table style="width: 100%;"> <tr><td>1. Bearing Devices</td><td style="text-align: center;">7</td></tr> <tr><td>2. Stringers</td><td style="text-align: center;">7</td></tr> <tr><td>3. Diaphragms</td><td style="text-align: center;">N</td></tr> <tr><td>4. Girders or Beams</td><td style="text-align: center;">N</td></tr> <tr><td>5. Floor Beams</td><td style="text-align: center;">8</td></tr> <tr><td>6. Trusses</td><td style="text-align: center;">8</td></tr> <tr><td>7. Rivets or Bolts</td><td style="text-align: center;">N</td></tr> <tr><td>8. Welds</td><td style="text-align: center;">8</td></tr> <tr><td>9. Collision Damage</td><td style="text-align: center;">8</td></tr> <tr><td>10. Load Deflection</td><td style="text-align: center;">8</td></tr> <tr><td>11. Member Alignment</td><td style="text-align: center;">8</td></tr> <tr><td>12. Load Vibration</td><td style="text-align: center;">8</td></tr> <tr><td>13. Paint-Epoxy</td><td style="text-align: center;">Y</td></tr> <tr><td>14. Year Painted</td><td style="text-align: center;">1996</td></tr> <tr><td>15. Under Clearance _____ ft _____ in</td><td></td></tr> <tr><td>Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no</td><td></td></tr> </table>	1. Bearing Devices	7	2. Stringers	7	3. Diaphragms	N	4. Girders or Beams	N	5. Floor Beams	8	6. Trusses	8	7. Rivets or Bolts	N	8. Welds	8	9. Collision Damage	8	10. Load Deflection	8	11. Member Alignment	8	12. Load Vibration	8	13. Paint-Epoxy	Y	14. Year Painted	1996	15. Under Clearance _____ ft _____ in		Clearance Signs <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		<p>item 60 <span style="float: right;">8</span></p> <p>SUBSTRUCTURE</p> <table style="width: 100%;"> <tr><td colspan="2">1. Abutments</td></tr> <tr><td>a-Wings</td><td style="text-align: center;">8</td></tr> <tr><td>b-Backwall</td><td style="text-align: center;">6</td></tr> <tr><td>c-Bridge Seats</td><td style="text-align: center;">6</td></tr> <tr><td>d-Breastwall</td><td style="text-align: center;">8</td></tr> <tr><td>e-Footings</td><td style="text-align: center;">IA</td></tr> <tr><td>f-Piles</td><td style="text-align: center;">N</td></tr> <tr><td>g-Erosion</td><td style="text-align: center;">8</td></tr> <tr><td>h-Settlement</td><td style="text-align: center;">6</td></tr> <tr><td colspan="2">2. Piers or Bents</td></tr> <tr><td>a-Caps</td><td style="text-align: center;">N</td></tr> <tr><td>b-Column</td><td style="text-align: center;">N</td></tr> <tr><td>c-Web</td><td style="text-align: center;">N</td></tr> <tr><td>d-Footing</td><td style="text-align: center;">N</td></tr> <tr><td>e-Piles</td><td style="text-align: center;">N</td></tr> <tr><td>f-Scour</td><td style="text-align: center;">N</td></tr> <tr><td>g-Settlement</td><td style="text-align: center;">N</td></tr> <tr><td>3. Collision Damage</td><td style="text-align: center;">8</td></tr> <tr><td>4. Hydraulic-Adequacy</td><td style="text-align: center;">8</td></tr> </table>	1. Abutments		a-Wings	8	b-Backwall	6	c-Bridge Seats	6	d-Breastwall	8	e-Footings	IA	f-Piles	N	g-Erosion	8	h-Settlement	6	2. Piers or Bents		a-Caps	N	b-Column	N	c-Web	N	d-Footing	N	e-Piles	N	f-Scour	N	g-Settlement	N	3. Collision Damage	8	4. Hydraulic-Adequacy	8
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<p>Actual Posting <span style="margin-left: 20px;">H 3 3S2</span></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <input type="checkbox"/> - <input type="checkbox"/> - <input type="checkbox"/> </div> <div style="text-align: center;"> <input type="checkbox"/> Single         </div> </div> <p>Recommended Posting From Rating Book <span style="margin-left: 20px;">9 15 24</span></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <input type="checkbox"/> </div> <div style="text-align: center;"> <input type="checkbox"/> </div> </div> <p>SIGNS IN PLACE <span style="margin-left: 20px;">at bridge</span></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <input type="checkbox"/> Y or N         </div> <div style="text-align: center;"> <input type="checkbox"/> advance         </div> </div> <p>LEGIBILITY <span style="margin-left: 20px;"></span></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <input type="checkbox"/> </div> <div style="text-align: center;"> <input type="checkbox"/> </div> </div>	<p>Overhead Signs (attached to bridge)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <input type="checkbox"/> yes         </div> <div style="text-align: center;"> <input checked="" type="checkbox"/> no         </div> </div> <table style="width: 100%;"> <tr><td>1. Welds</td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Bolts</td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Condition</td><td style="text-align: center;"><input type="checkbox"/></td></tr> </table> <p>Item93b U/W Inspection Date: <u>-</u></p>	1. Welds	<input type="checkbox"/>	2. Bolts	<input type="checkbox"/>	3. Condition	<input type="checkbox"/>
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<p>ITEM 61-channel and channel protection <span style="float: right;">8</span></p> <table style="width: 100%;"> <tr><td>1. channel scour</td><td style="text-align: center;">8</td><td>5. rip rap or slope paving</td><td style="text-align: center;">N</td></tr> <tr><td>2. embankment erosion</td><td style="text-align: center;">8</td><td>6. effectiveness</td><td style="text-align: center;">8</td></tr> <tr><td>3. fender system</td><td style="text-align: center;">N</td><td>7. debris</td><td style="text-align: center;">8</td></tr> <tr><td>4. spur dikes &amp; jetties</td><td style="text-align: center;">N</td><td>8. vegetation</td><td style="text-align: center;">8</td></tr> </table>	1. channel scour	8	5. rip rap or slope paving	N	2. embankment erosion	8	6. effectiveness	8	3. fender system	N	7. debris	8	4. spur dikes & jetties	N	8. vegetation	8	<p>36-Traffic Safety features</p> <table style="width: 100%;"> <tr><td>1. bridge railing</td><td style="text-align: center;">36</td><td style="text-align: center;">condition</td></tr> <tr><td>2. transitions</td><td style="text-align: center;">1</td><td style="text-align: center;">7</td></tr> <tr><td>3. approach guardrail</td><td style="text-align: center;">0</td><td style="text-align: center;">-</td></tr> <tr><td>4. guardrail terminal</td><td style="text-align: center;">1</td><td style="text-align: center;">7</td></tr> </table>	1. bridge railing	36	condition	2. transitions	1	7	3. approach guardrail	0	-	4. guardrail terminal	1	7
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**X=UNKNOWN**

**NA=NOT APPLICABLE**

**IA=INACCESSIBLE**

PROJECT: Ball Mountain Lake, VT  
 BRIDGE: Slason Bridge  
 LOCATION: Londonderry VT

# BRIDGE INSPECTION SCOUR CHECKLIST

1. Is the bridge currently experiencing, or does it have a history of, scour activity?

no
2. Is the streambed erodible? If so, does the structure have any vulnerable design features?

yes

  - a. Piers, abutments with spread footings or short pile foundations.

yes
  - b. Superstructure with simple spans or non-redundant support systems.

yes
  - c. Inadequate waterway openings.

no
  - d. Designs which collect ice and debris.

no
  - e. All water must pass through or over structure.

yes
  - f. Other.

-
3. Are any characteristics of an aggressive stream or waterway present?

no

  - a. Active degradation or aggradation of streambed.

no
  - b. Significant lateral movement or erosion of streambanks.

no
  - c. Steep slopes.

no
  - d. High velocities.

no
  - e. Any history of highway or bridge damage during past floods.

no
  - f. Other.

-
4. Is the bridge located on a stream reach with any adverse flow characteristics?

no

  - a. Crossing near stream confluence.

no
  - b. Crossing of tributary stream near confluence with larger streams.

no
  - c. Crossing on sharp bend in stream.

no
  - d. Location on alluvial fan.

no
  - e. Other.

-
5. Other comments or observations.

-



## NBI Metric Structural Inventory and Appraisal

Date Printed: 09/02/98

(202) Corps of Engineers Structure Number: CEPNEDVT5010001

(8) NBI Structure Number: CEPNEDVT5010001

## Geographic and Route Data

## Dimensional Data

## Inspection Data

(1) State	Vermont	(32) Approach Rdwy Width	4.1 M	(90) Inspection Date (MoYr)	0898
(2) District	00	(39) Navigation Vert Clr	0.0 M	(91) Inspection Frequency	24 Mo
(3) County	000	(40) Navigation Horz Clr	0.0 M	(92) Critical Feature Insp	(93) Date
(4) Place	00000	(48) Max Span Length	0027.4 M	Frac Crit Insp : N	00 /
(6) Feature Under	WINHALL BROOK	(49) Str Length	00028.3 M	Underwater Insp: N	00 /
(7) Facility on	REC AREA ACCESS RD	(50) Curb/Sidewalk Width	Left 00.2 M	Other Spec Insp: N	00 /
(9) Location	1.61 KM EAST OF ROUTE 8		Right 00.2 M		
(16) Latitude	43° 12' 48.00"	(51) Brg Rdwy Width, curb-curb	003.2 M		
(17) Longitude	072° 61' 24.00"	(52) Deck Width out-out	004.1 M		
(98) Border Bridge		(53) Min Vert Clr over	99.99 M		
(99) Border Bridge Str No		(54) Min Vert Clr under	N 00.00 M		
(103) Temporary Str		(55) Min Lat Underclr R	N 00.0 M		
		(56) Min Lat Underclr L	99.9 M		

## On and Under Record Data

(112) NBIS Bridge Length	Y
(116) Navigation Min Vert Clr	0.0 M

	Route On
(5) Inventory Route	168000000
(10) Min Vert Clr	99.99 M
(11) Kilometer Point	0000.000
(19) Detour Length	199 km
(20) Toll	3
(26) Func Class	09
(28) Lanes on/under	0100
(29) ADT	100
(30) Year of ADT	1998
(47) Total Horz Clearance	04.1 M
(100) Defense Hwy	0
(101) Parallel Str	N
(102) Direction of Traffic	3
(104) Hwy System	0
(109) Truck Traffic	00%
(110) Natl Truck Network	No

## Proposed Improvements

(75) Type of Work	
(76) Improvement Length	000000 M
(94) Bridge Improv Cost	0
(95) Rdwy Improv Cost	0
(96) Total Proj Cost	0
(97) Year of Cost Est	0000
(114) Future ADT	100
(115) Year of Future ADT	2015

## Condition Rating

(58) Deck	7
(59) Superstructure	8
(60) Substructure	8
(61) Channel & Channel Protect	8
(62) Culverts	N

## General Data

(21) Maintenance Responsibility	70
(22) Owner	70
(31) Design Load	2
(33) Bridge Median	0
(34) Skew	00 deg
(35) Str Flared	No
(37) Hist Significance	5
(38) Navigation Control	0
(42) Type of Service	55
(43) Structure Type Main	310
(44) Structure Type Approach	000
(45) No of Span Main	001
(46) No of Approach Spans	0000
(27) Year Built	1928
(106) Year Reconstructed	0000
(107) Deck Str Type	8
(108) Wear Surf/Protv Sys	000
(111) Nav Pier/Abut Protection	

## Appraisal Rating

(67) Structure Evaluation	3
(68) Deck Geometry	2
(69) Underclrn Vert & Horz	N
(71) Waterway Adequacy	8
(72) Approach Rdwy Alignment	3
(36) Traffic Safety Features	1011
(113) Scour Critical Bridges	8

## Load Rate and Post

(41) Str Open/Post/Close	Open
(64) Operating Rating	10.9 ton
(66) Inventory Rating	08.2 ton
(70) Bridge Posting	5

## Over 200 Items

(200) COE MSC	CENAD
(201) COE District	CENAE
(202) Structure Number	CEPNEDVT5010001
(203) Inspection Office	EPDG
(204) Inspector	JOE COLUCCI
(205) Inspection Cost	007000
(206) Cooper's Loading	
(207) Railroad Stru Number	
(208) Name of Railroad	
(209) Recommended Speed Limit	
(210) Posted Speed Limit (KPH)	
(211) MACOM	
(212) Installation Name	
(213) Military Wheel Load Class	
(214) Military Truck Load Class	
(215) Installation Number	
(216) Seismic Category	
(217) Acceleration Coefficient	0.00
(218) Soil Site Coefficient	0.0

Sufficiency Rating = 030.1

Functionally Obsolete



PHOTO NO. 1  
DAMAGED NORTHEAST BRIDGE RAIL AND BENT CURB ANCHOR BOLTS



PHOTO NO. 2  
SCRAPED RAIL AT  
NORTHWEST APPROACH



PHOTO NO. 3  
BROKEN CRIBBING BLOCK AT SOUTHEAST CURB

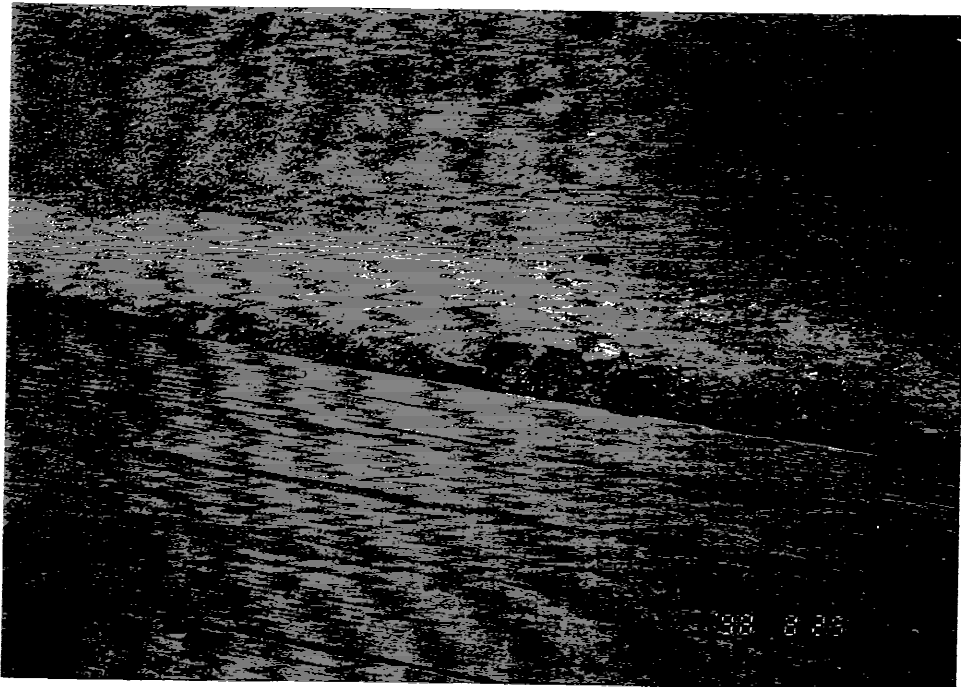


PHOTO NO. 4  
ABRADED SOUTH ABUTMENT BACKWALL

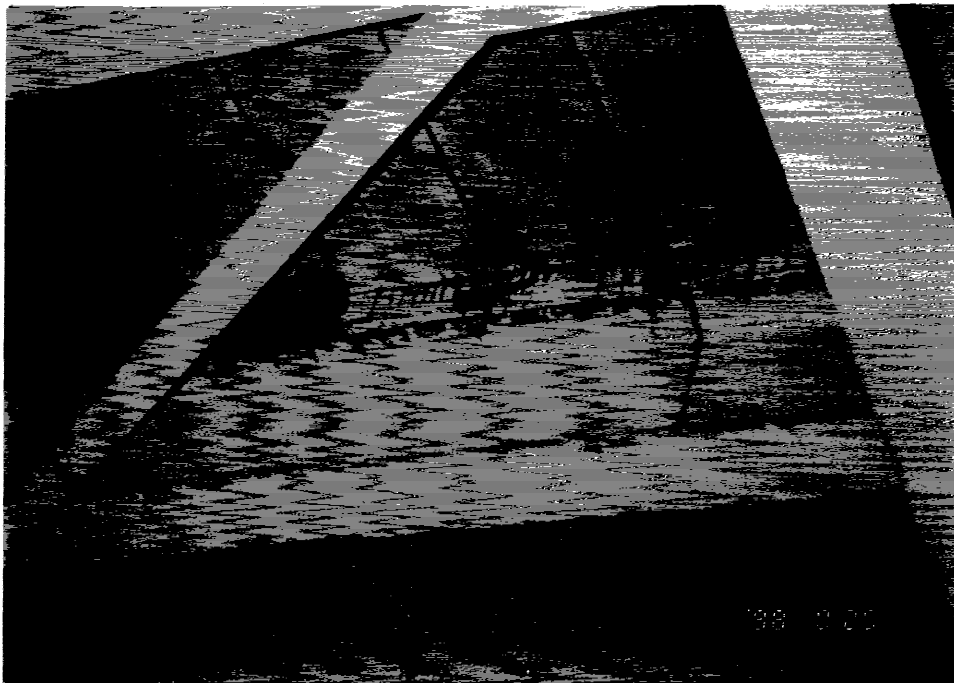


PHOTO NO. 5  
STAINING AT TIMBER/STRINGER INTERFACE

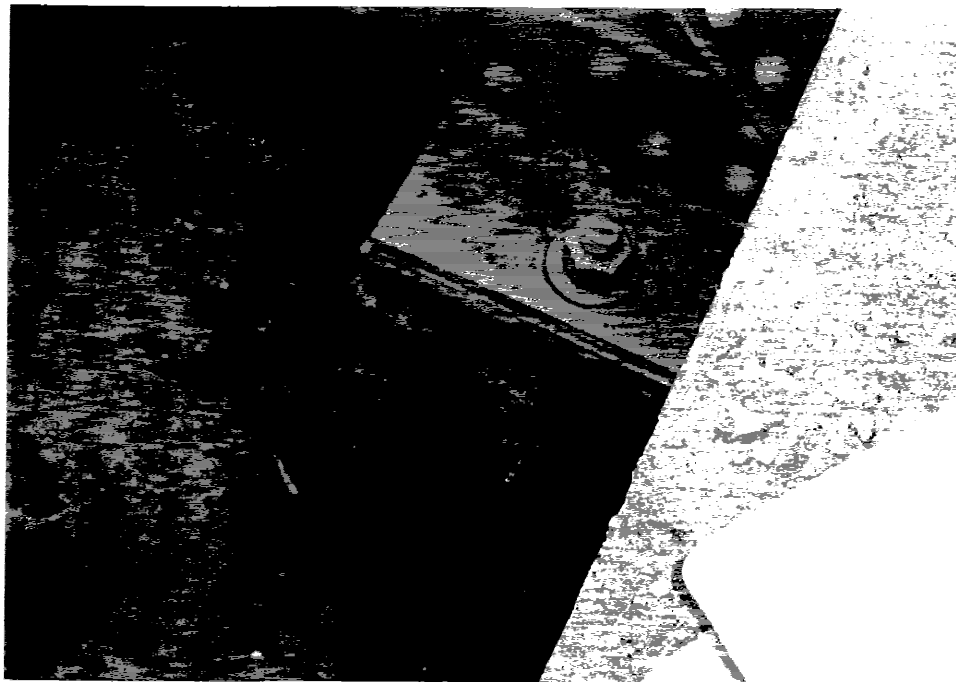


PHOTO NO. 6  
CORROSION AT SOUTHWEST BEARING